

Conceptual Blending in Higher-Order Human Cognition

School of Literature, Communication, and Culture
Georgia Institute of Technology



Mark Turner

<http://markturner.org>

Department of Cognitive Science



CASE WESTERN RESERVE
UNIVERSITY EST. 1826

Lascaux Bull



Chauvet



Chauvet



Chauvet



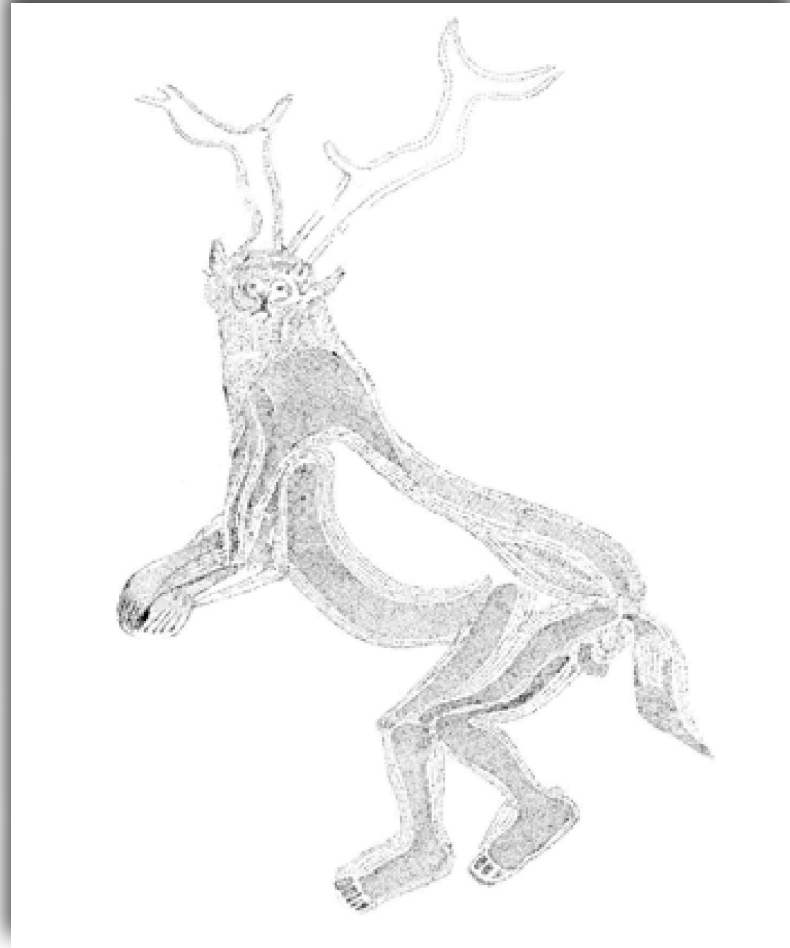
Willendorf

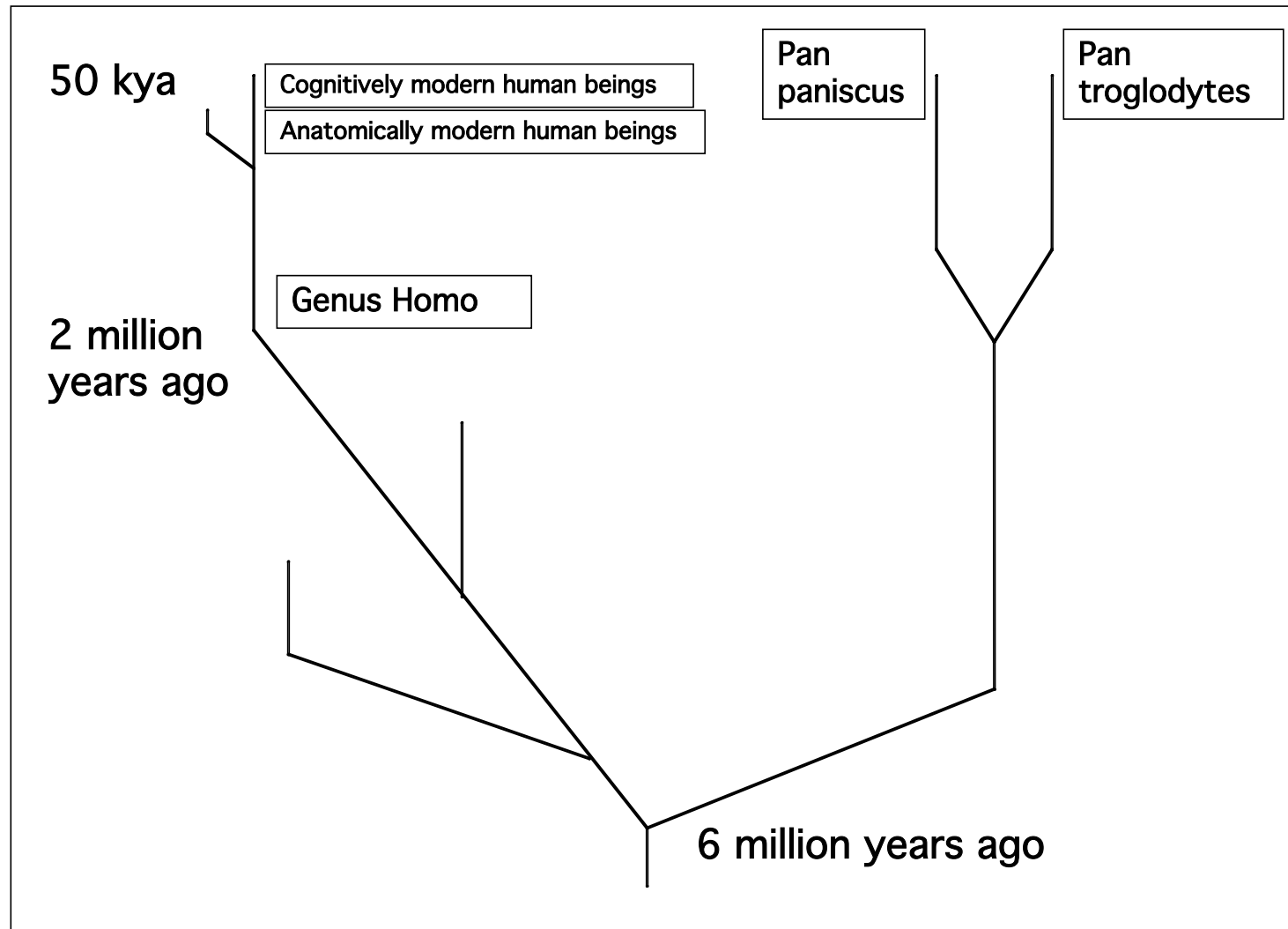


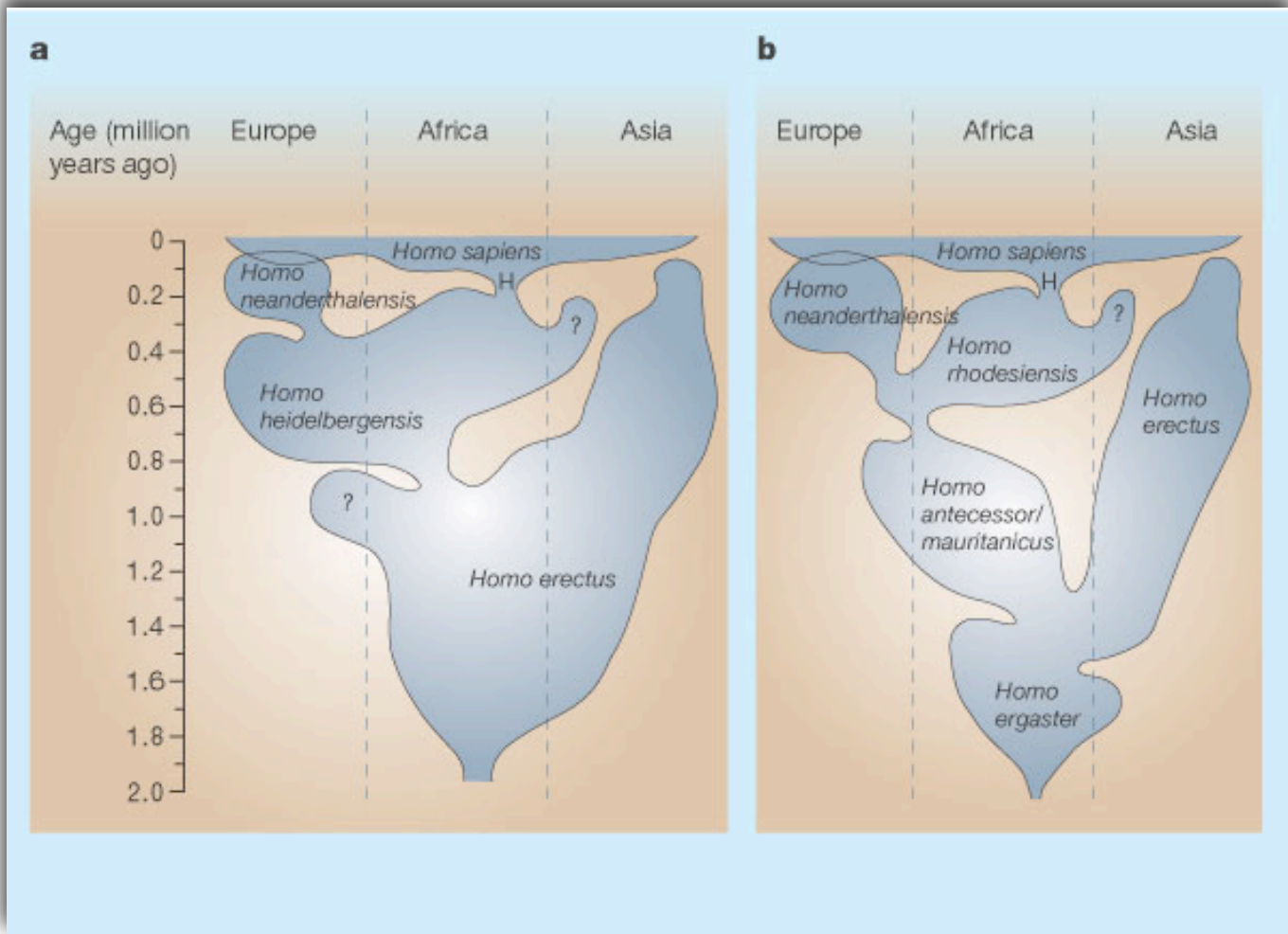
Ivory beads sewn into cloth, Burial at Sunghir



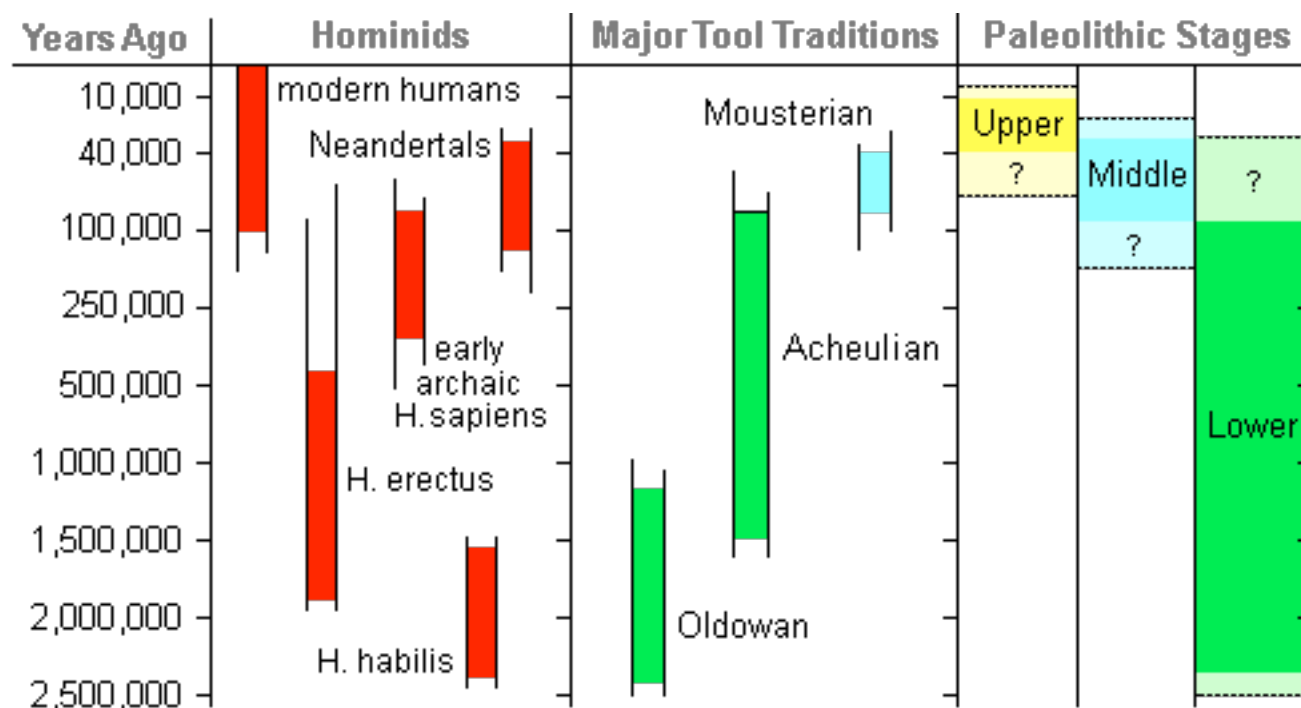
From “The Sanctuary” at Trois-Frères

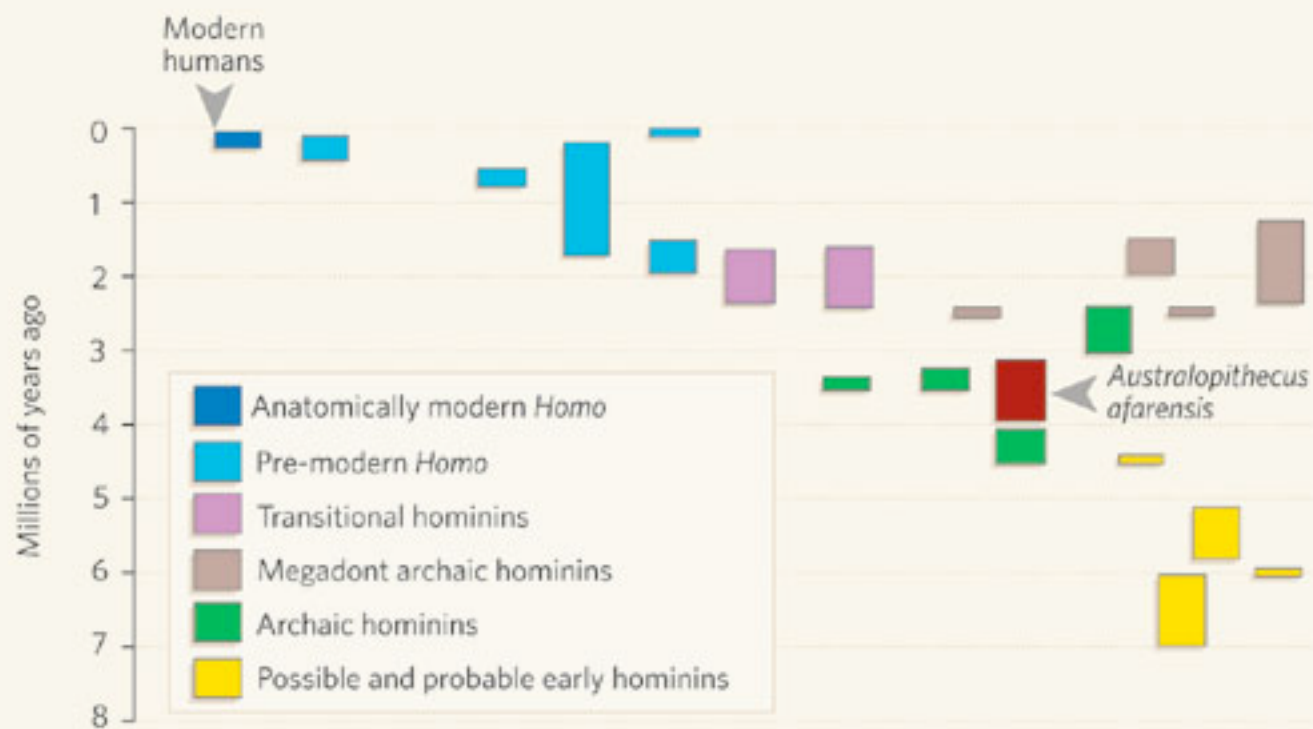


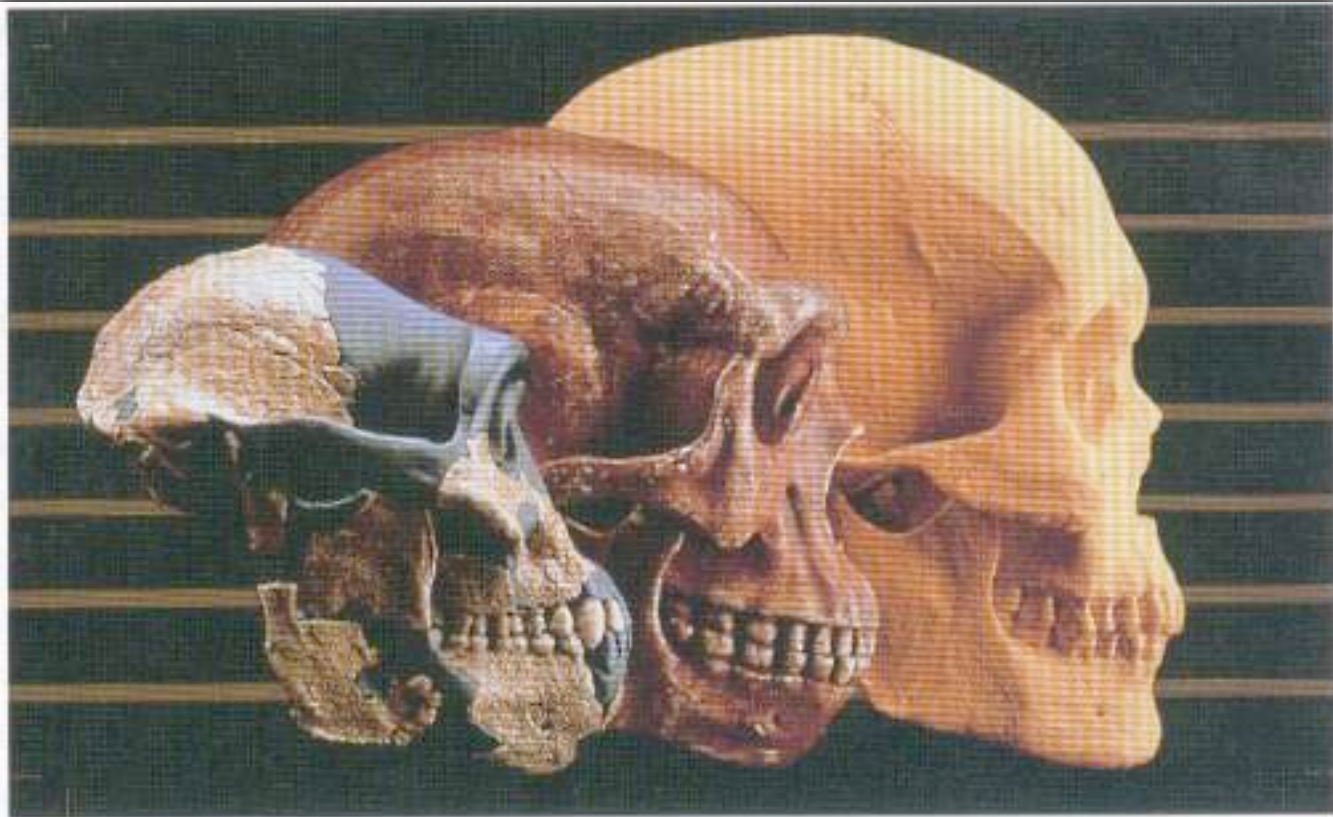




Stringer, Chris. 2003. "Human evolution: Out of Ethiopia." *Nature* 423, 692 - 695.







K. O'Farrell/Concepts

Separation through biological evolution



Gorilla gorilla beringei - Eastern gorilla species



Gorilla gorilla gorilla - Western gorilla species



Homo sapiens - Human beings (Homo sapiens sapiens)



Pan paniscus - Bonobo, or pygmy chimpanzee



Pan troglodytes - Chimpanzee



Pongo pygmaeus - Orangutan

Lemur catta catta

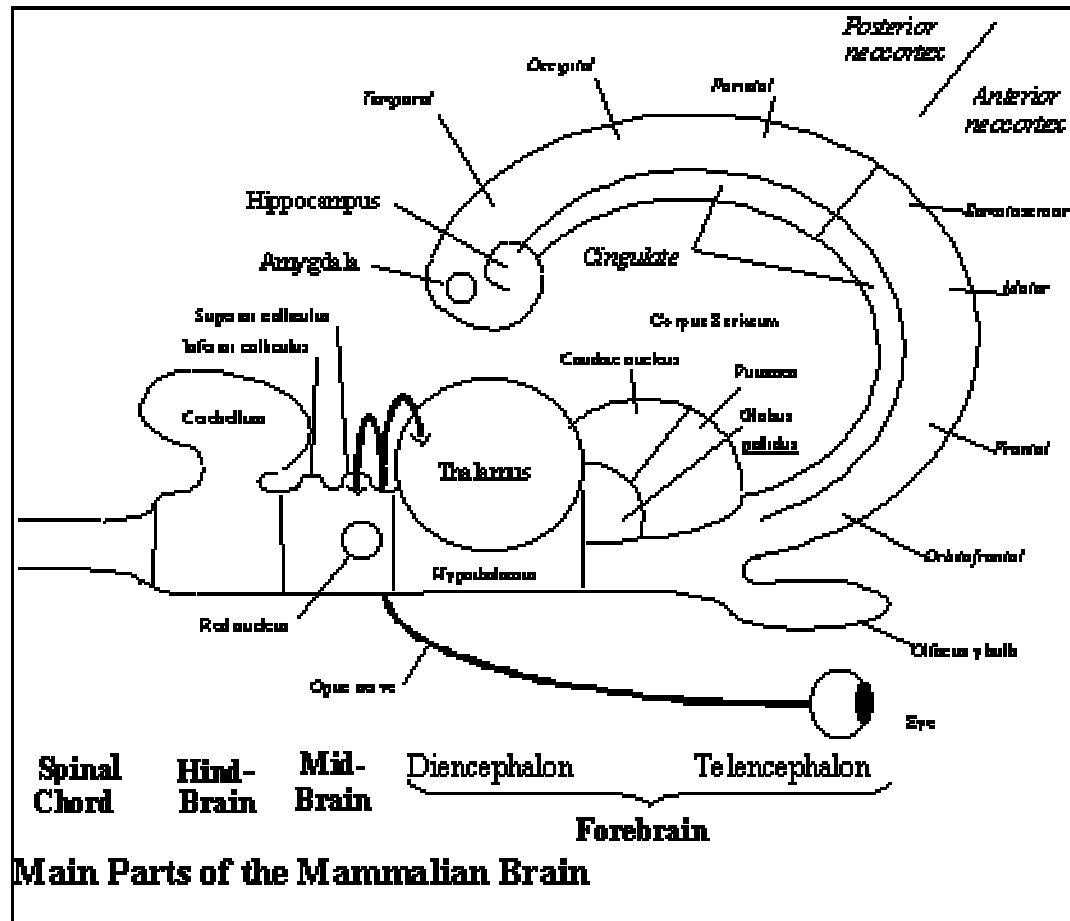
Homo sapiens sapiens

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Primates
Family: Lemnridae
Genus Lemur
Species: Lemur catta

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Primates
Family: Hominidae
Genus Homo
Species: Homo sapiens









Vesalius 1542

Language, Communication, Culture, Diversity?



How can they exist?



Why do they exist?

Emergence of New Meaning?

Emergence of New Meaning?



Evolutionary Psychology

Emergence of New Meaning?



Evolutionary Psychology



Schemata (Learning)

Emergence of New Meaning?



Evolutionary Psychology



Schemata (Learning)



Complexity Theory

Emergence of New Meaning?



Evolutionary Psychology



Schemata (Learning)



Complexity Theory

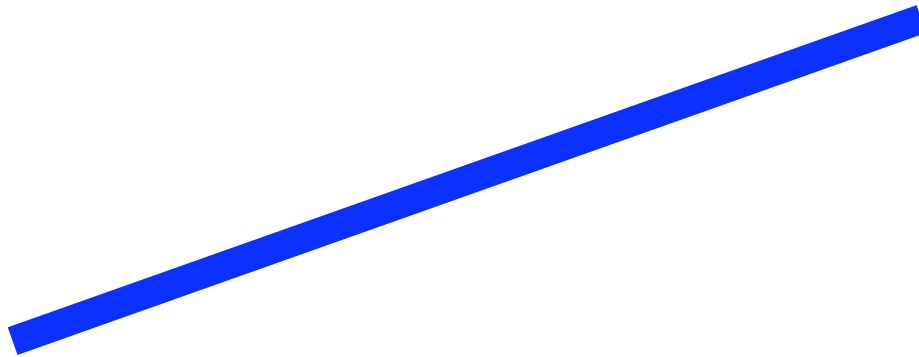


Conceptual Blending

Human Scale and Compression

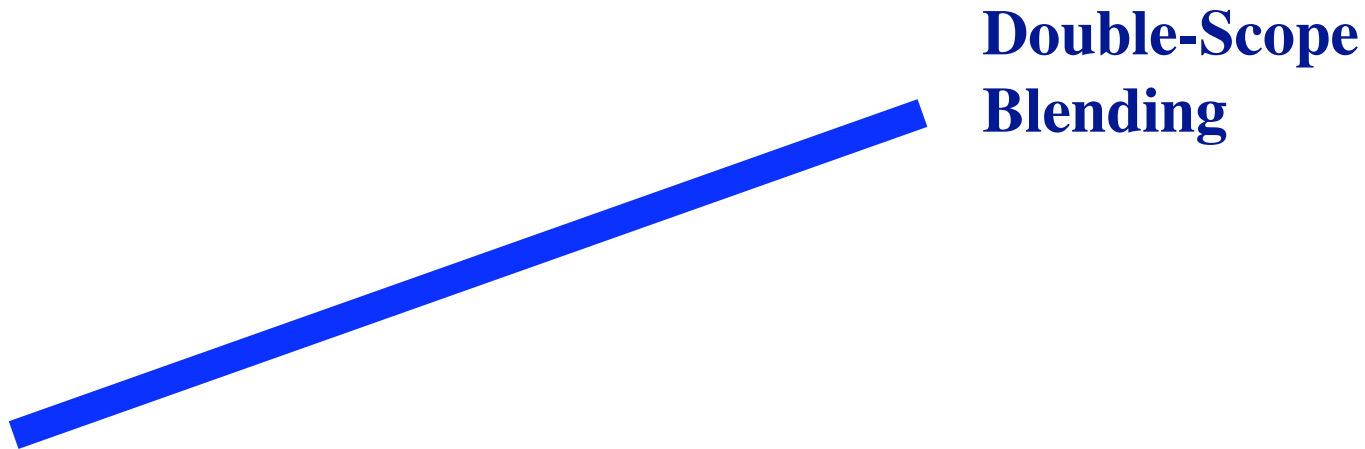
Conceptual Integration (Blending)

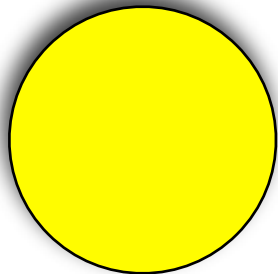
A gradient from rudimentary forms to an advanced form: Double-Scope Blending

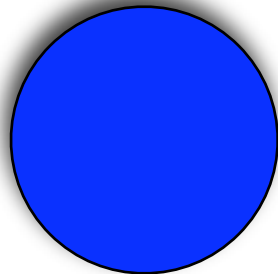
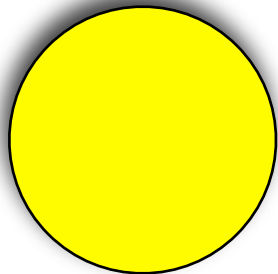


Conceptual Integration (Blending)

A gradient from rudimentary forms to an advanced form: Double-Scope Blending







What Memory Is For

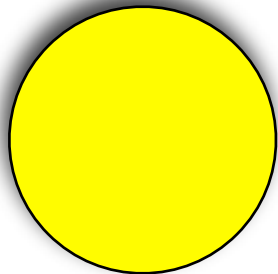
As Arthur Glenberg (1997) writes in “What Memory Is For,”

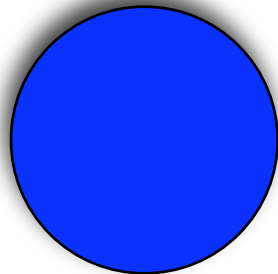
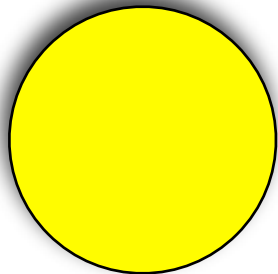
To avoid hallucination, conceptualization would normally be driven by the environment, and patterns of action from memory would play a supporting, but automatic, role.

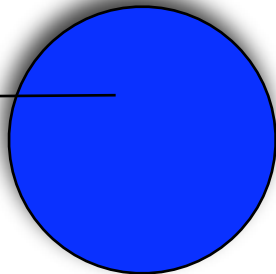
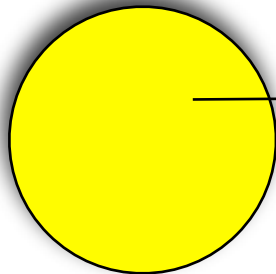
(Glenberg 1997, 1)

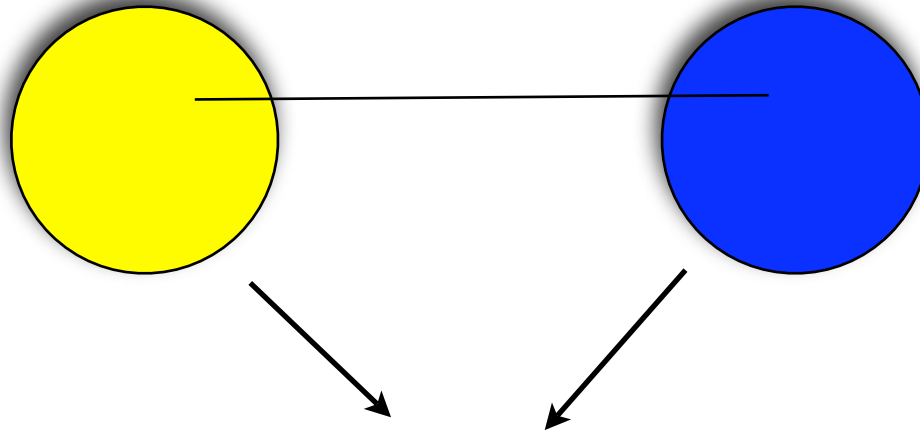
But as Glenberg astutely observes, for human beings, it is often the case that memory takes the upper hand in conceptualizing the narrative one is inhabiting:

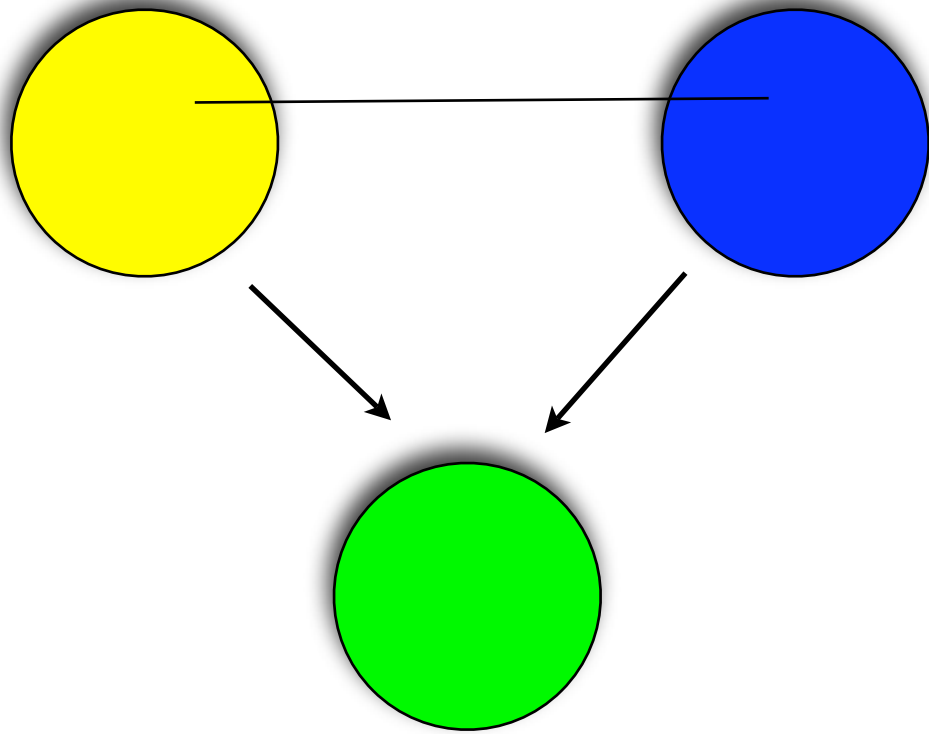
A significant human skill is learning to suppress the overriding contribution of the environment to conceptualization, thereby allowing memory to guide conceptualization. (Glenberg 1997, 1)

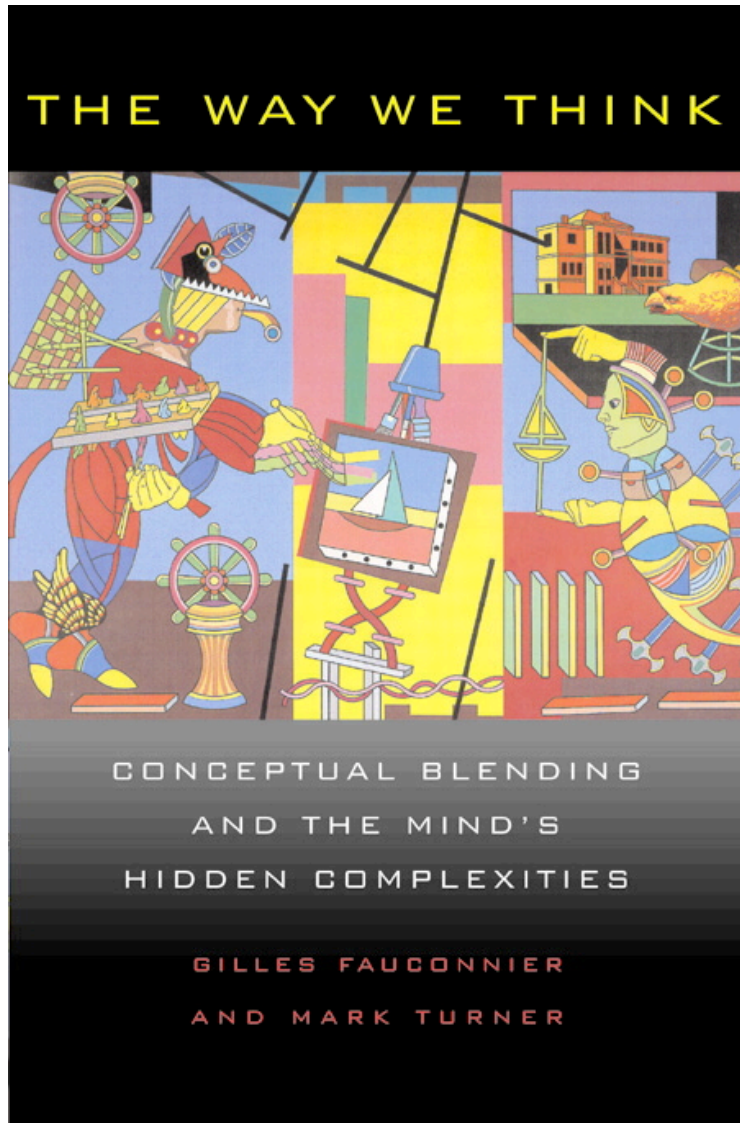












*The Way We Think:
Conceptual Blending and
the Mind's Hidden
Complexities*

Gilles Fauconnier & Mark
Turner, Basic Books, 2002

blending.stanford.edu

Traits

Higher-Order Cognitive Traits: The Wrong View

Higher-Order Cognitive Traits: The Wrong View

Music

Sign Systems

Religion

Literature

Language

Science

Art

Advanced music and dance

Advanced social cognition

Fashion

Refined tool use

Math

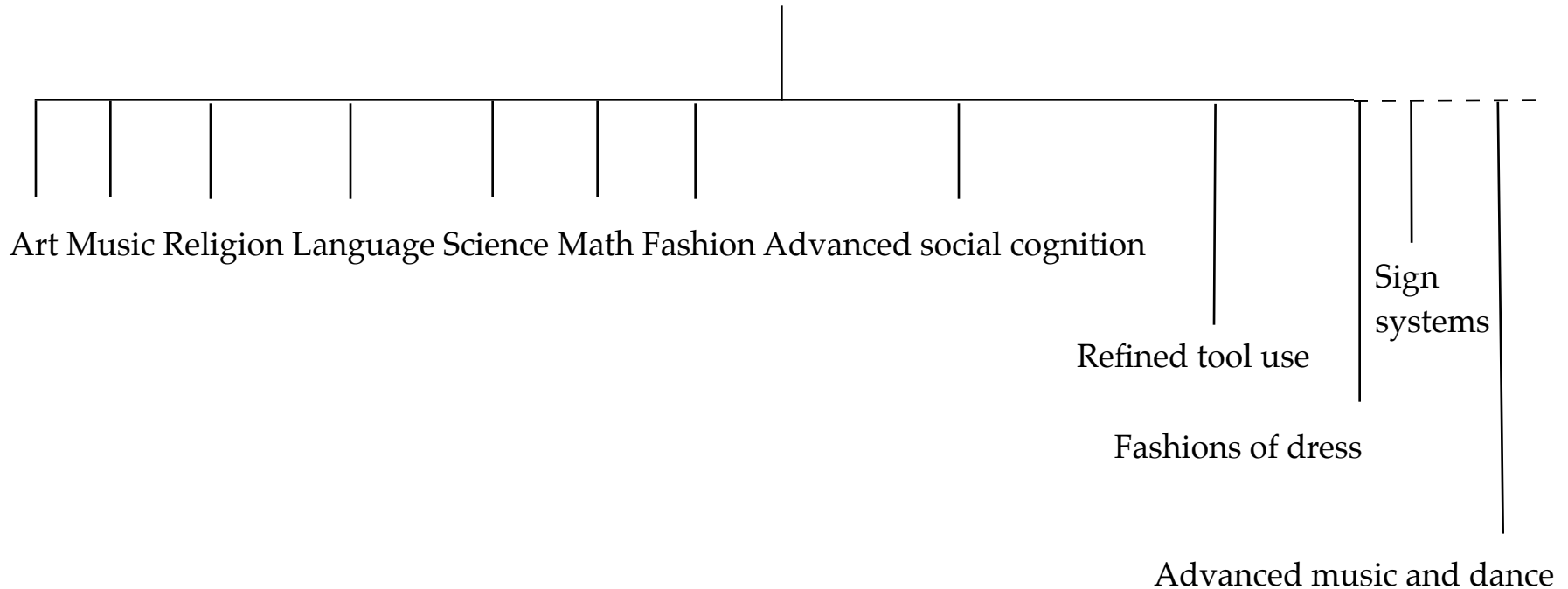
...

Higher-Order Cognitive Traits: The Right View

Double-Scope Blending

Higher-Order Cognitive Traits: The Right View

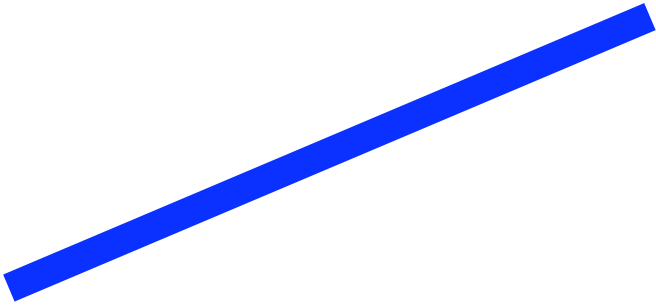
Double-Scope Blending



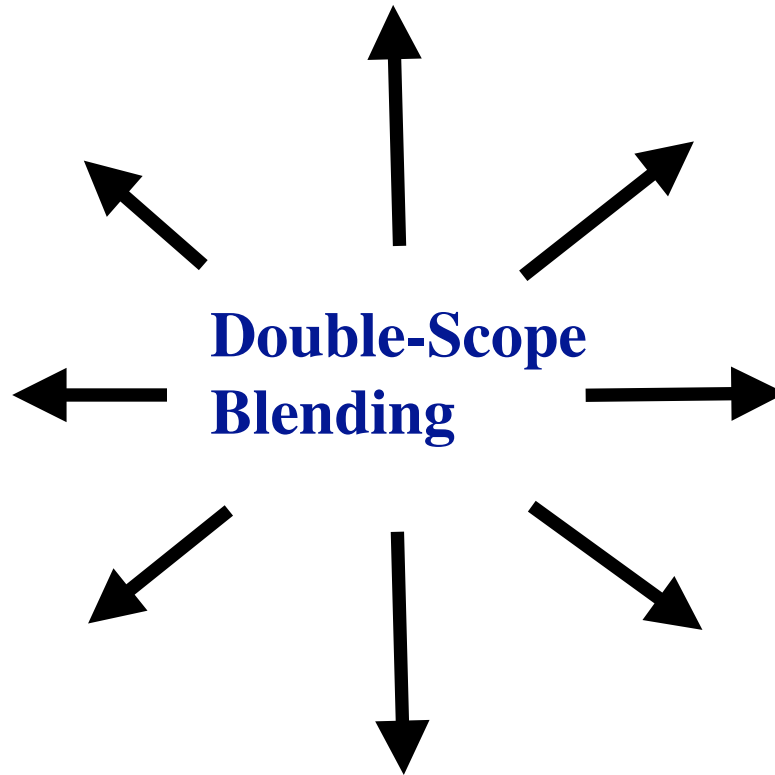
Traits

Traits

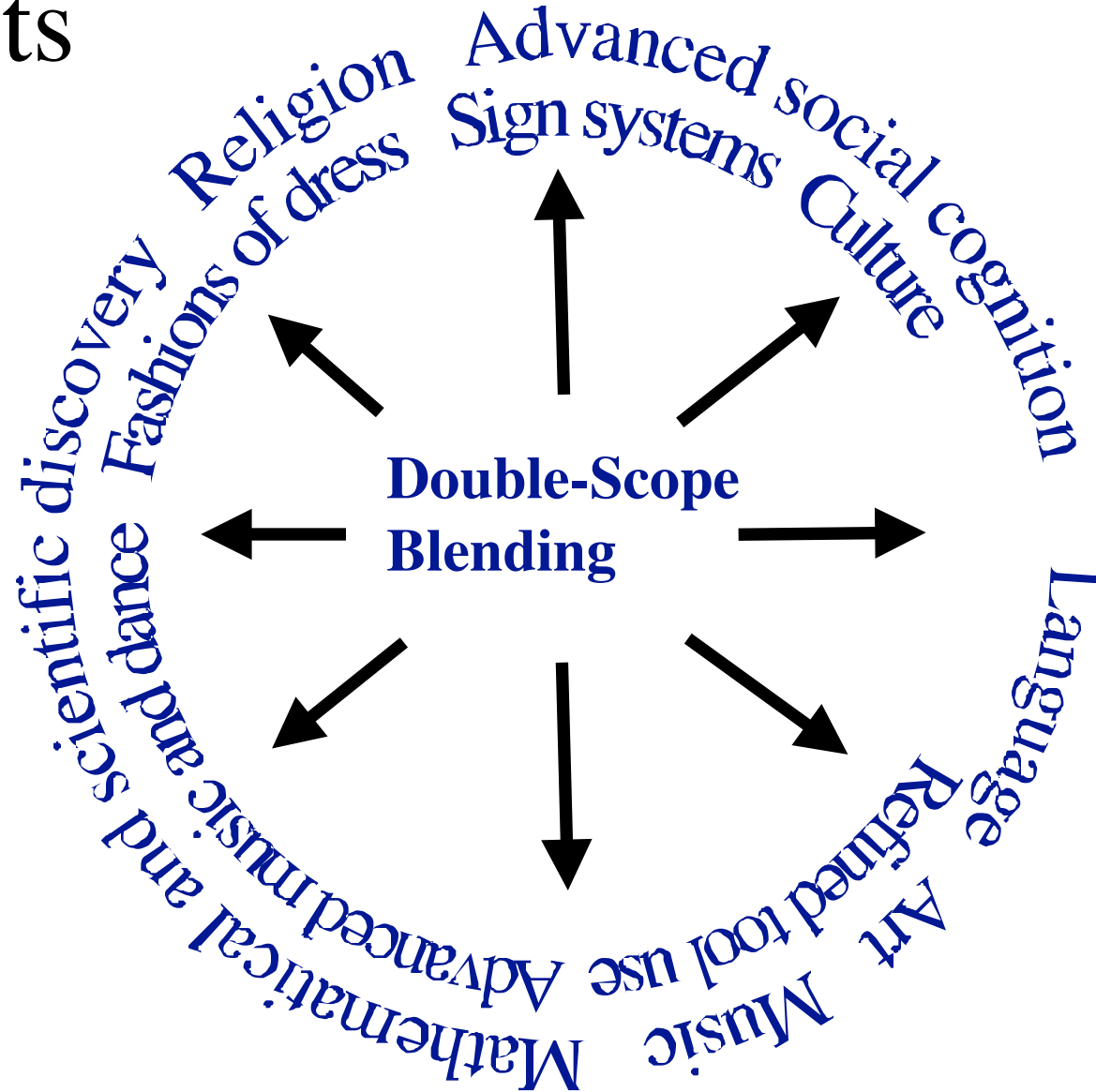
**Double-Scope
Blending**



Traits



Traits



Language, advanced social cognition, mathematical invention, scientific discovery, art, religion, music, advanced tool use and advanced technology, dance, fashions of dress, sign systems, culture . . . **A Pack, a Cohort, a Phalanx, a Troupe, a Self-feeding Cyclone, an Autocatalytic Vortex, a Breeder Reactor, a Self-organizing System . . .**

Cub Scout Law of the Pack

- The Cub Scout follows Akela.
- The Cub Scout helps the pack go.
- The pack helps the Cub Scout grow.

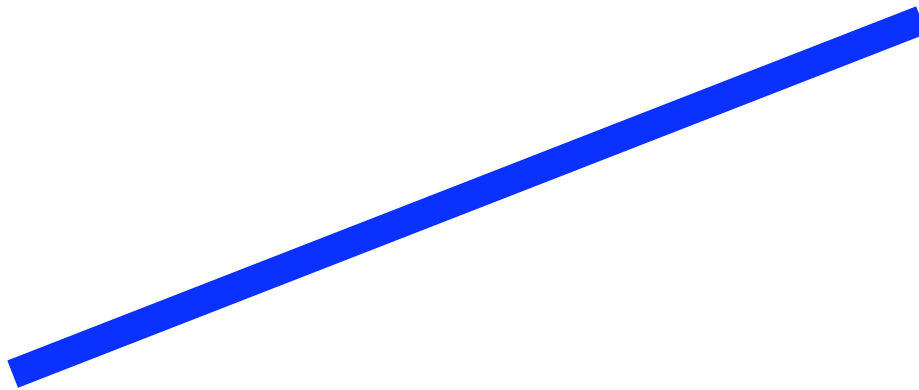
Rilke, *Duino Elegies*, 2.

. . . the shrewd animals
notice that we're not very much at home
in the world we've expounded.

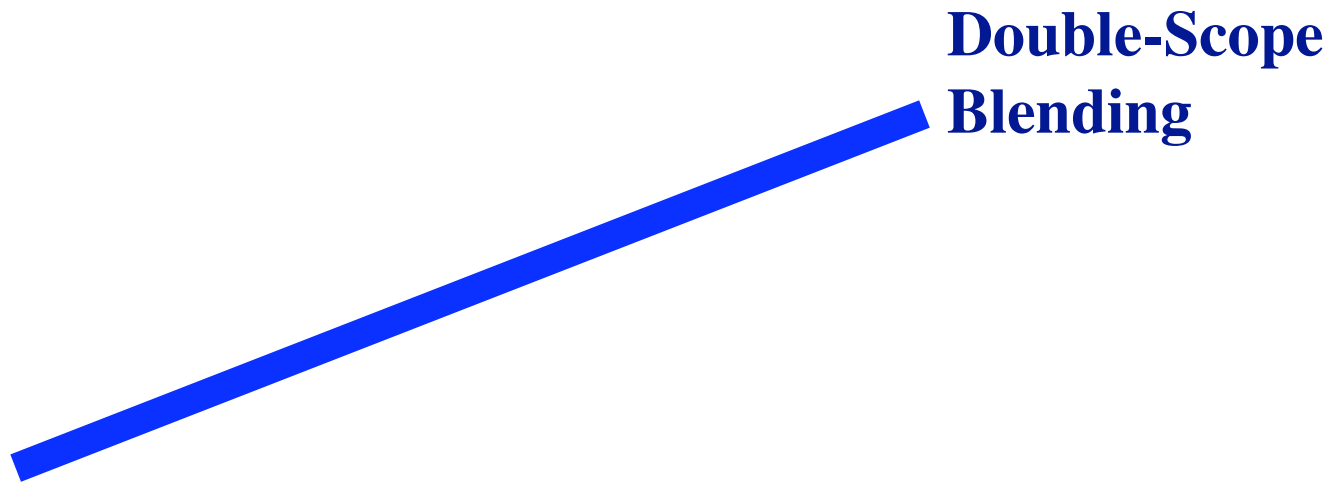
und die findigen Tiere merken es schon,
daß wir nich sehr verläßlich zu Haus sind
in der gedeuteten Welt.

(Rilke 1961 [1922]; 2)

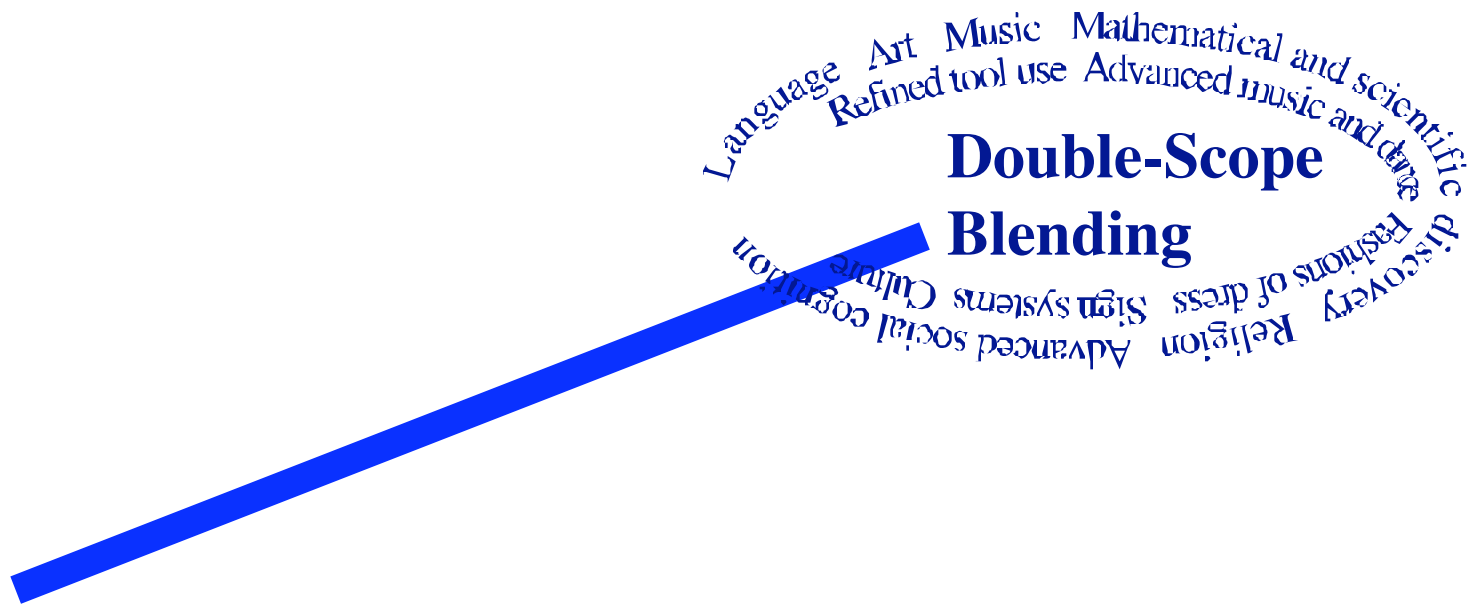
Conceptual Integration (Blending)

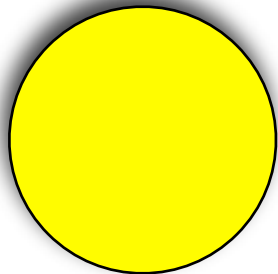


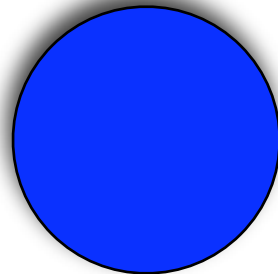
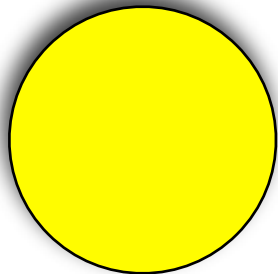
Conceptual Integration (Blending)

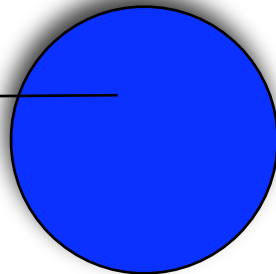
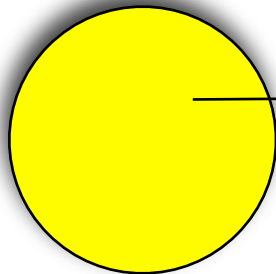


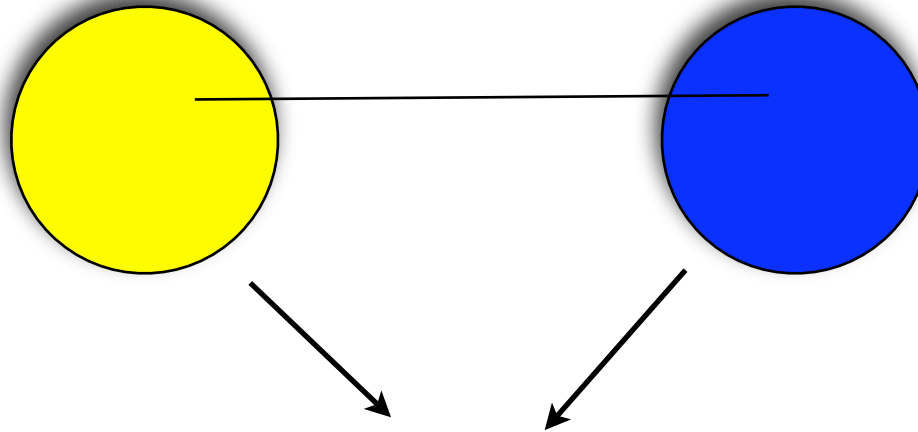
Conceptual Integration (Blending)

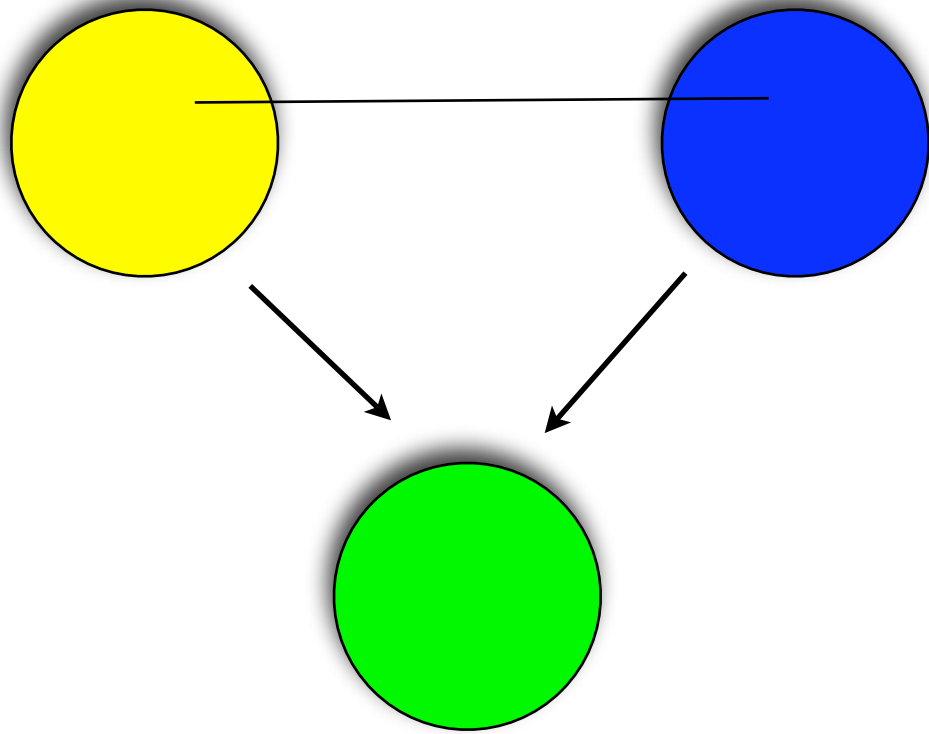






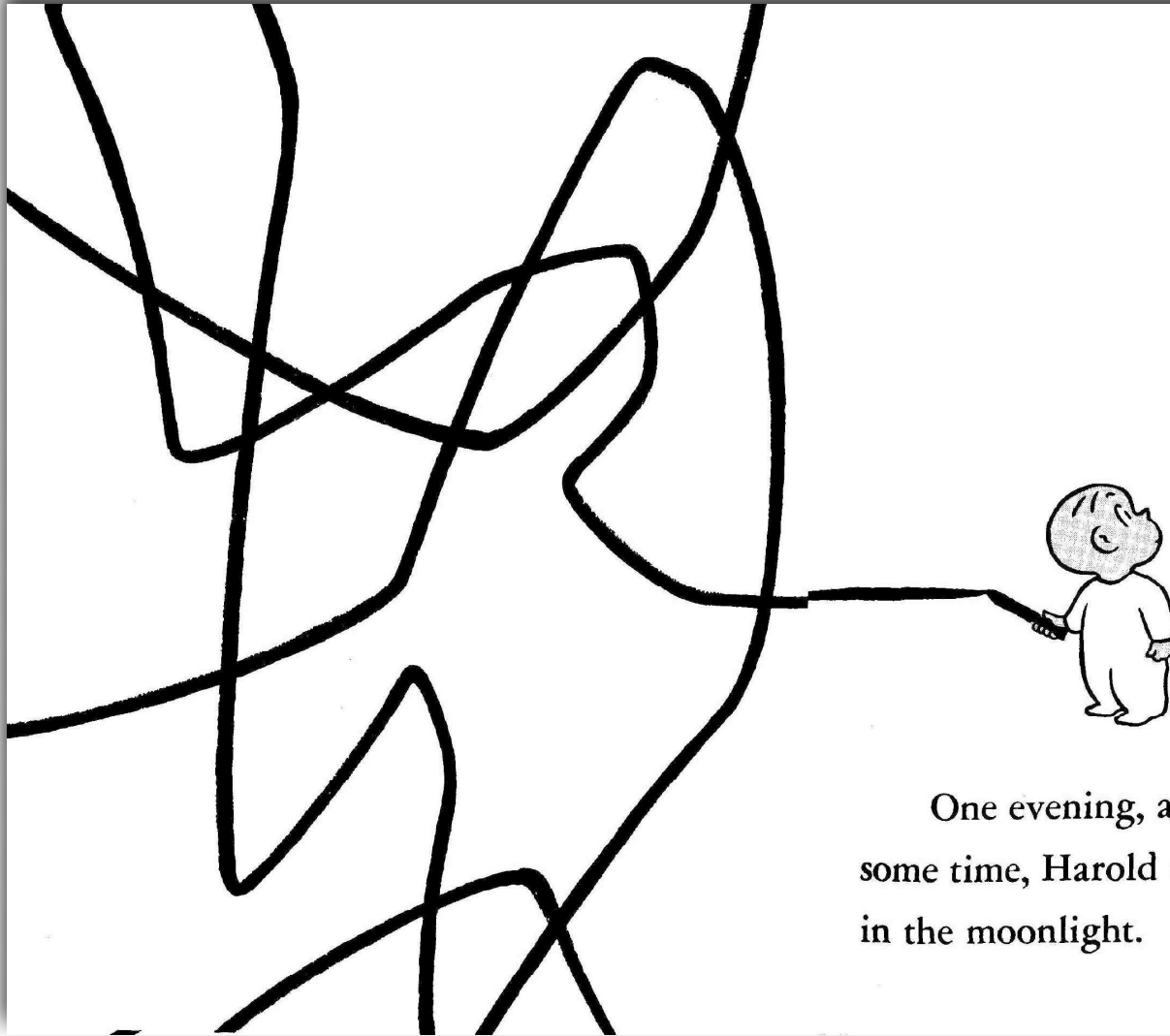




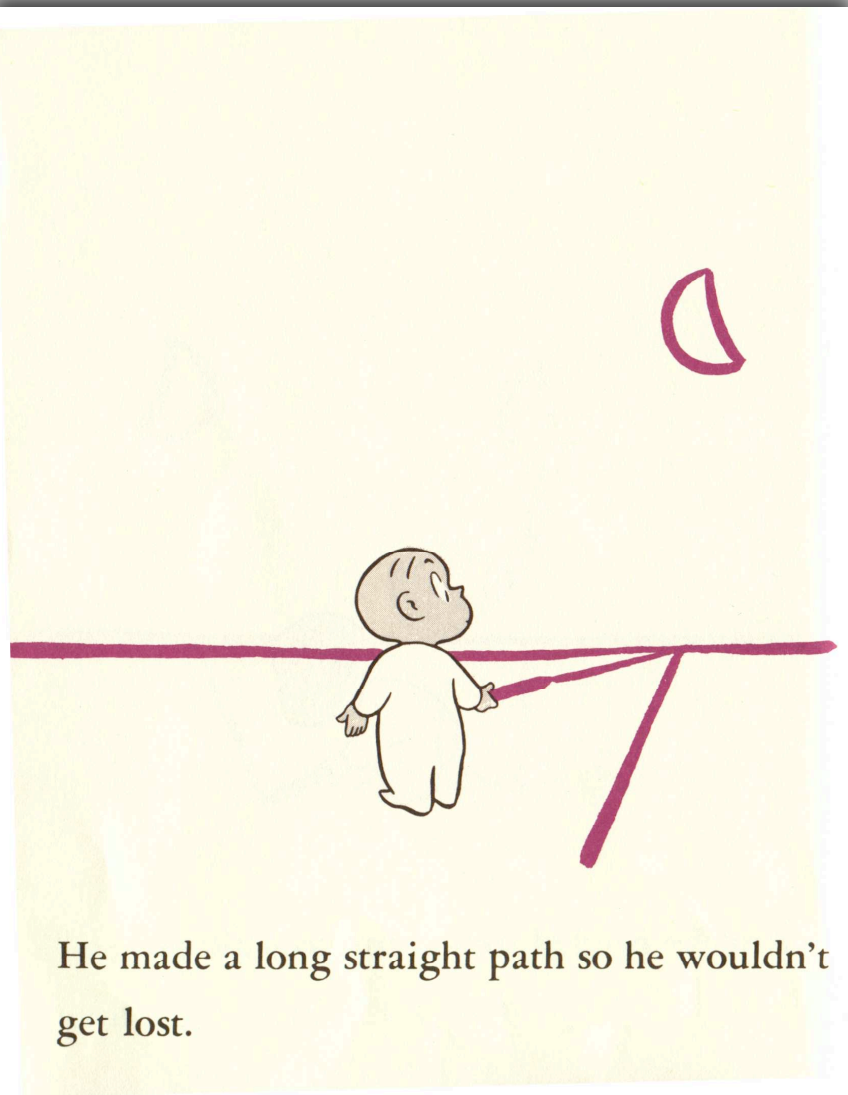


DOUBLE SCOPE NETWORKS

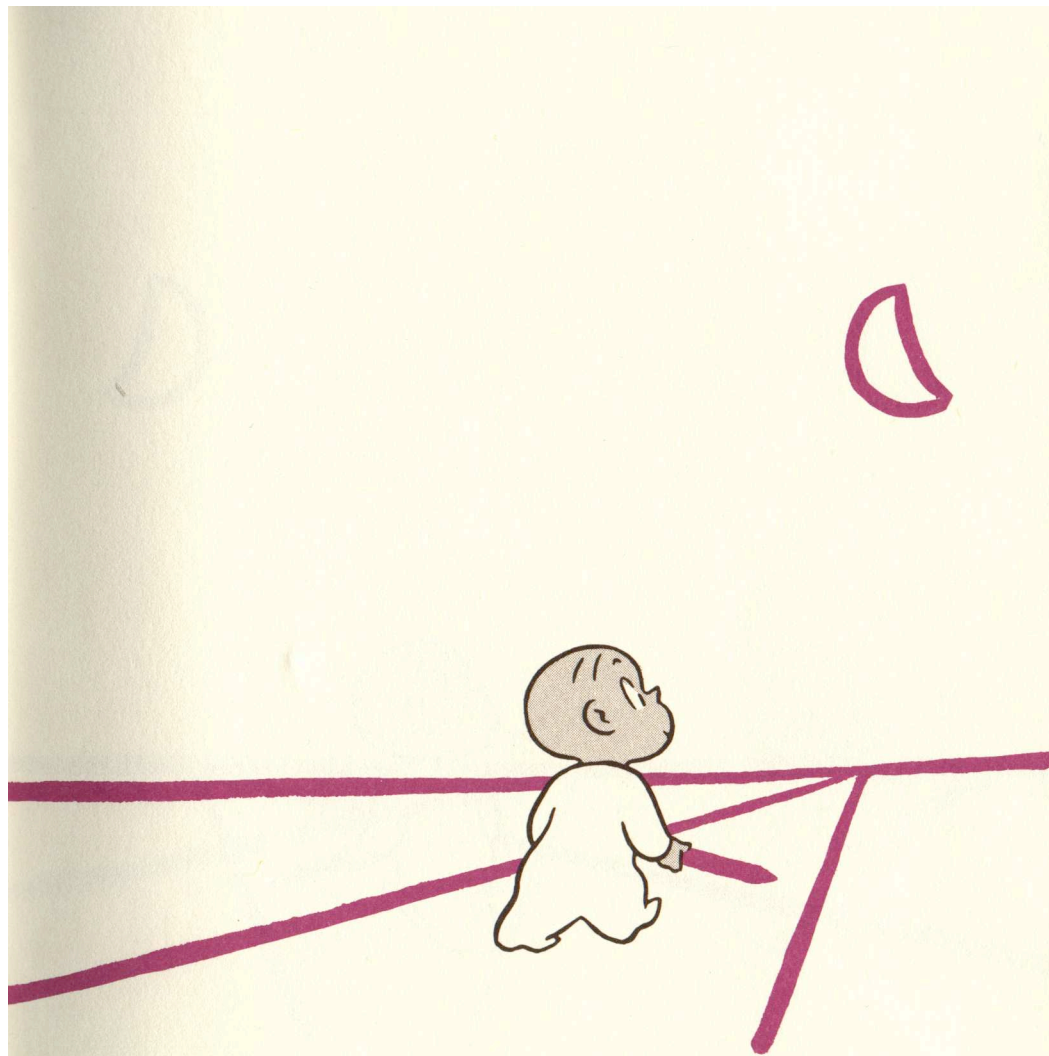
A double scope network has inputs with **different (and often clashing) organizing frames** and an organizing frame for the blend that includes parts of each of those organizing frames and has emergent structure of its own. In such networks, **both organizing frames make central contributions to the blend**, and their sharp differences offer the possibility of rich clashes. **Far from blocking the construction of the network, such clashes offer challenges to the imagination and the resulting blends can turn out to be highly creative.**



One evening, after thinking it over for some time, Harold decided to go for a walk in the moonlight.

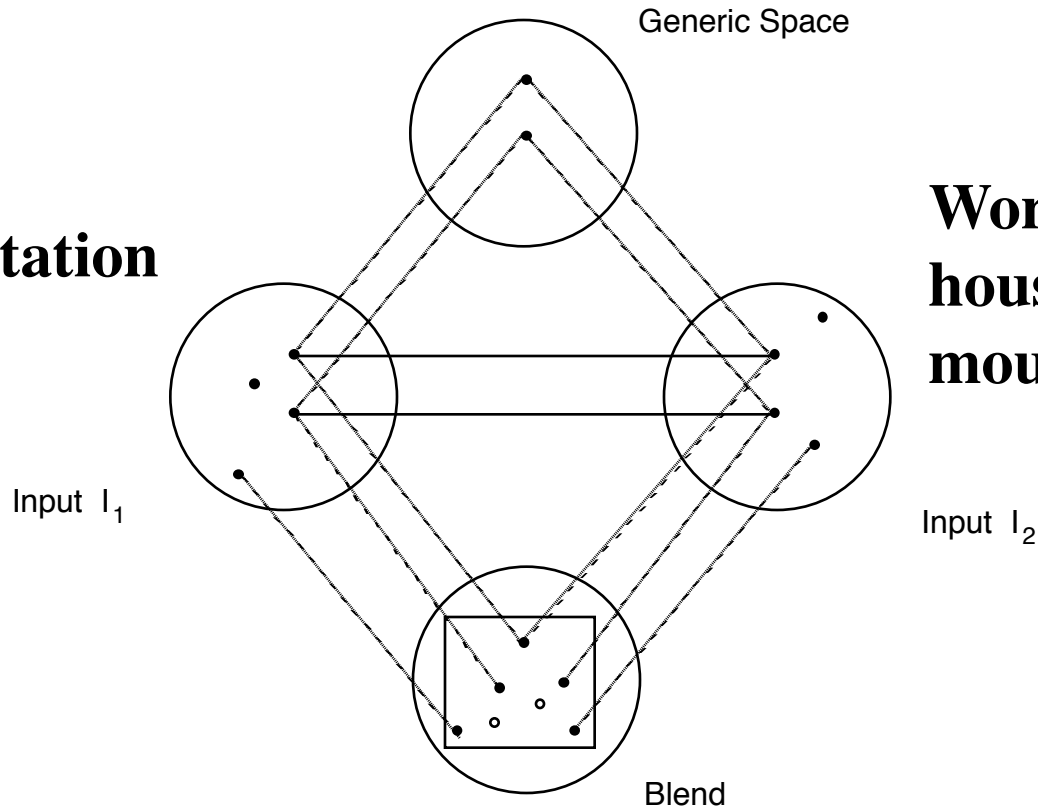


He made a long straight path so he wouldn't
get lost.



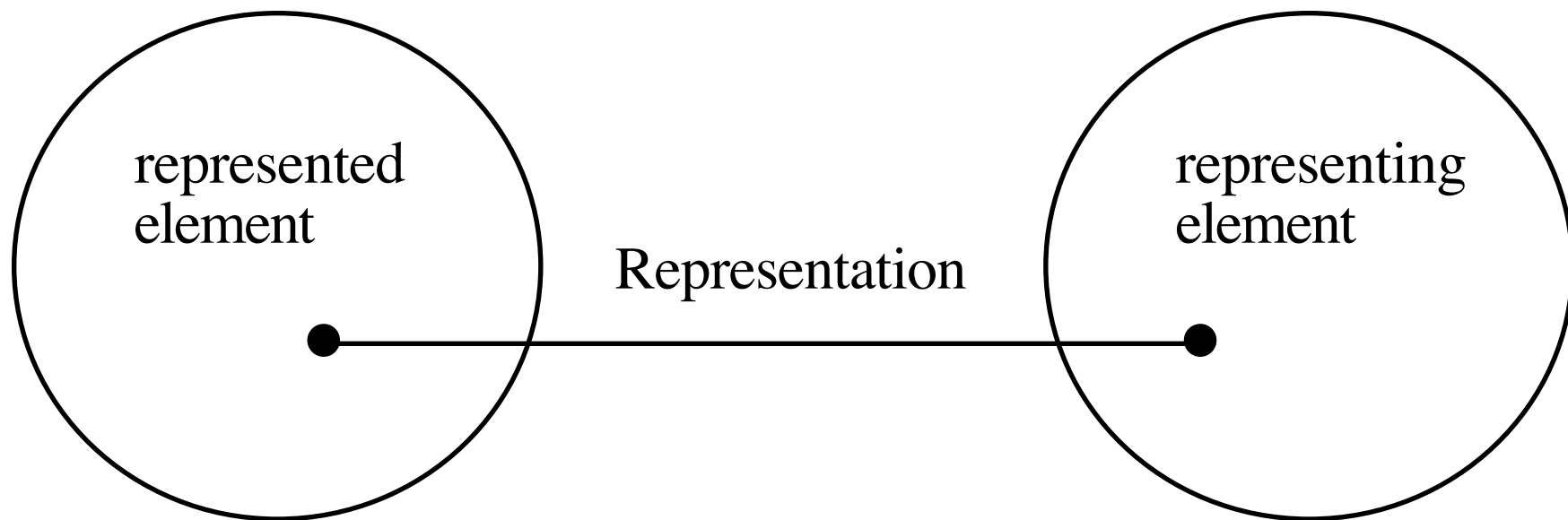
And he set off on his walk, taking his big
purple crayon with him.

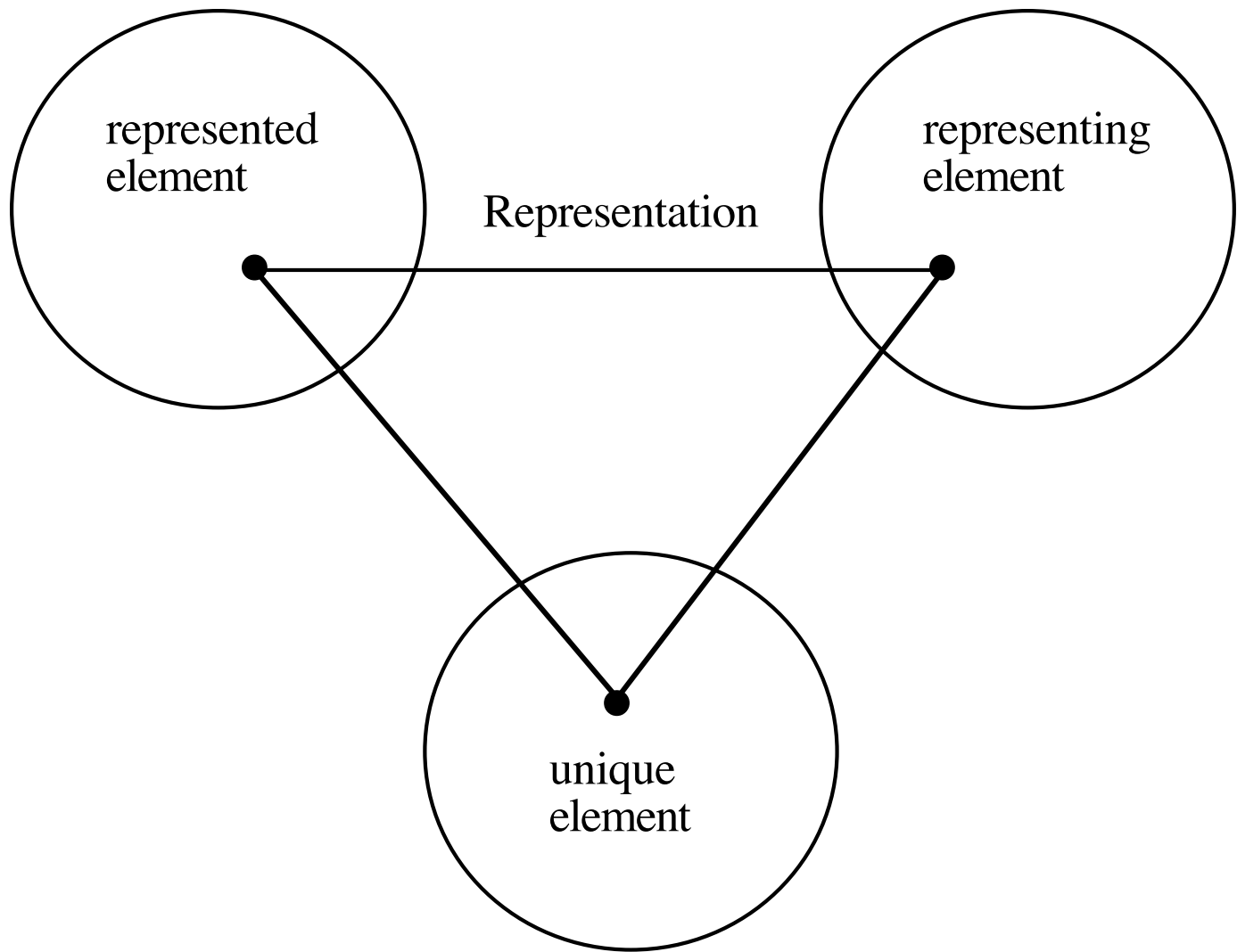
Representation

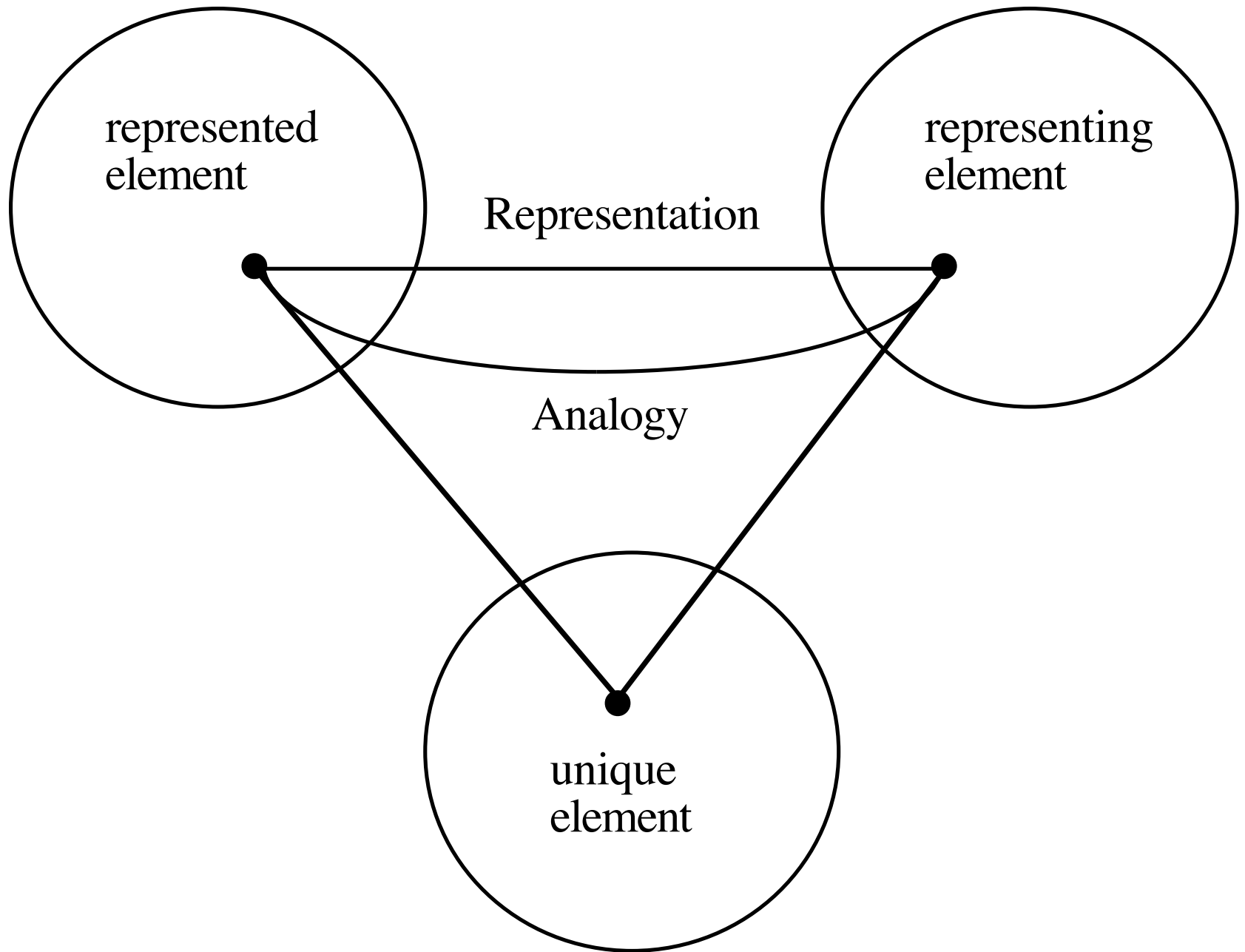


**World (moon,
house, bedroom,
mountain, etc.)**

**Harold's World
(move by drawing, etc.)**







We are lucky we're not
chickens

“If we were all chickens, you, William, would be about Elizabeth's age, you, Peyton, would be about Dad's age, and me, Dad, and Mom would all be dead of old age. We are all five alive. We are lucky we are not chickens.”

Seabiscuit: An American Legend, Laura Hillenbrand

An allegory of the American people:

Seabiscuit tells how an unimpressive older horse with crooked legs and a short tail stole the hearts and minds of the American people during the Depression. In 1938, the No. 1 newsmaker was not FDR or Hitler; it was a horse that defined the word 'underdog.'

It was the indefinable quality of 'being game' that captured Americans. As one observer put it, Seabiscuit would rather die than be beaten in a race. Yet, unlike many champion thoroughbreds, his off-track personality was low-key, appealing and, frankly, lazy. He was a glutton for food and enjoyed the friendship of a horse named Pumpkin.

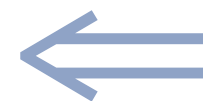
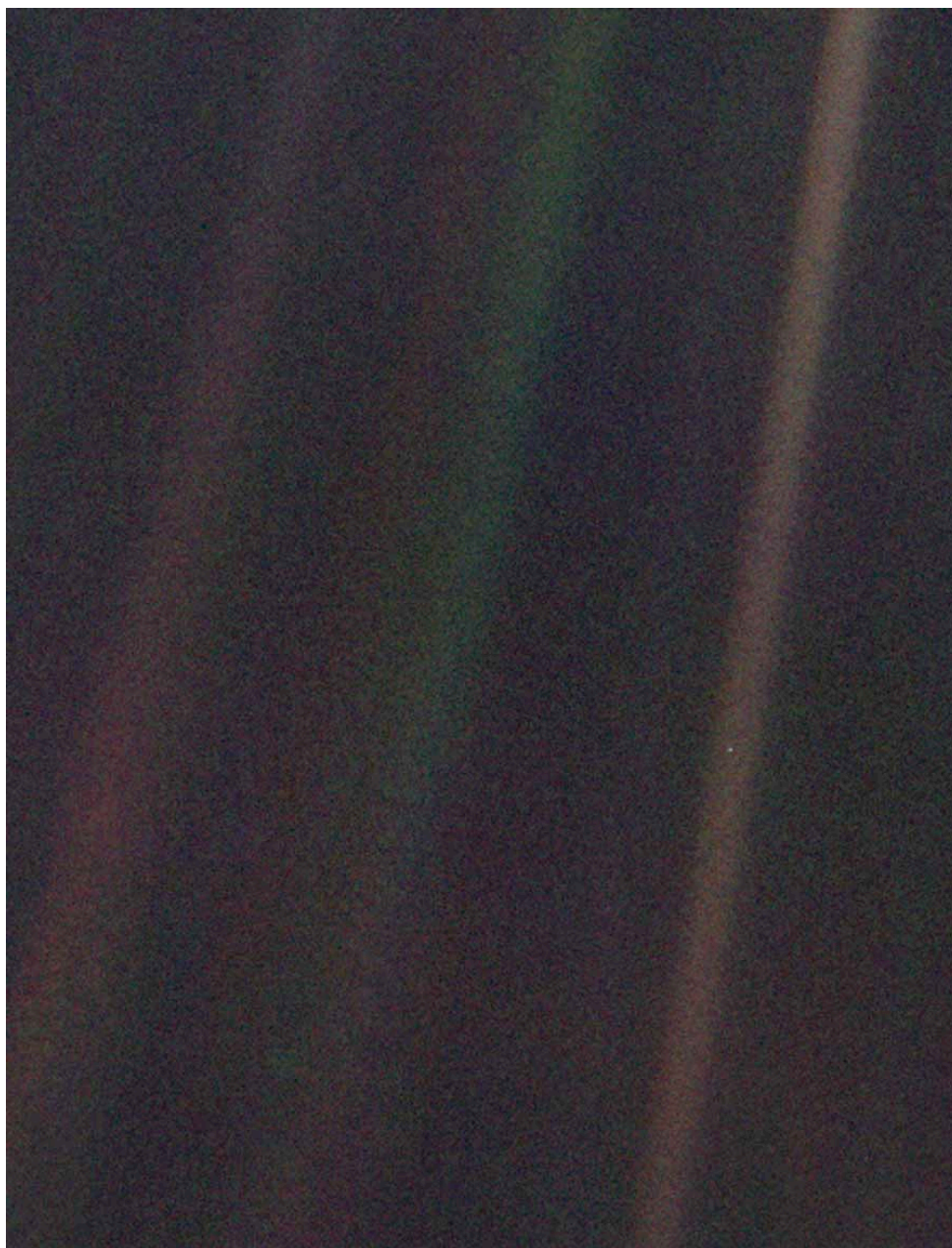
In short, he seemed the American Everyhorse, the equine version of how we see ourselves. Yet his race against the favored War Admiral is considered the greatest horse race in history. (Deirdre Donahue, 'Book club is spurred to choose "Seabiscuit"', *USA Today*, Thursday, 23 May 2002, page 1D.)

An Inconvenient Truth

“An Inconvenient Truth” is the film version of Al Gore’s slide-show presentation on global warming. Close to the end, Gore shows a picture of the Earth as a what he calls a “pale blue dot.” The Earth is a single pixel on a huge cosmological screen, difficult even to pick out when he points at it. The picture was taken from a distance in space of 4 billion miles. Gore says, “Everything that has ever happened in all of human history has happened on that dot. All the triumphs and tragedies, all the wars and all the famines, all the major advances. That is what is at stake—our ability to live on planet Earth, to have a future as a civilization.”

And then he concludes the film with this blend: “Future generations may well have occasion to ask themselves, 'What were our parents thinking? Why didn't they wake up when they had the chance?' **We have to hear that question from them now.**”

Pale Blue Dot





The Time Blend at the end of “An Inconvenient Truth”

And then he concludes the film with this blend: “Future generations may well have occasion to ask themselves, 'What were our parents thinking? Why didn't they wake up when they had the chance?' **We have to hear that question from them now.**”



Joey, Katie and Todd will be performing your bypass.

Before you know it, these kids will be doctors, nurses and medical technicians, possibly yours.

They'll need an excellent grasp of laser technology, advanced computing and molecular genetics. Unfortunately, very few American children are being prepared to master such sophisticated subjects.

If we want children who can handle

tomorrow's good jobs, more kids need to take more challenging academic courses.

To find out how you can help the effort to raise standards in America's schools, please call 1-800-95-PROMISE.

If we make changes now, we can prevent a lot of pain later on.

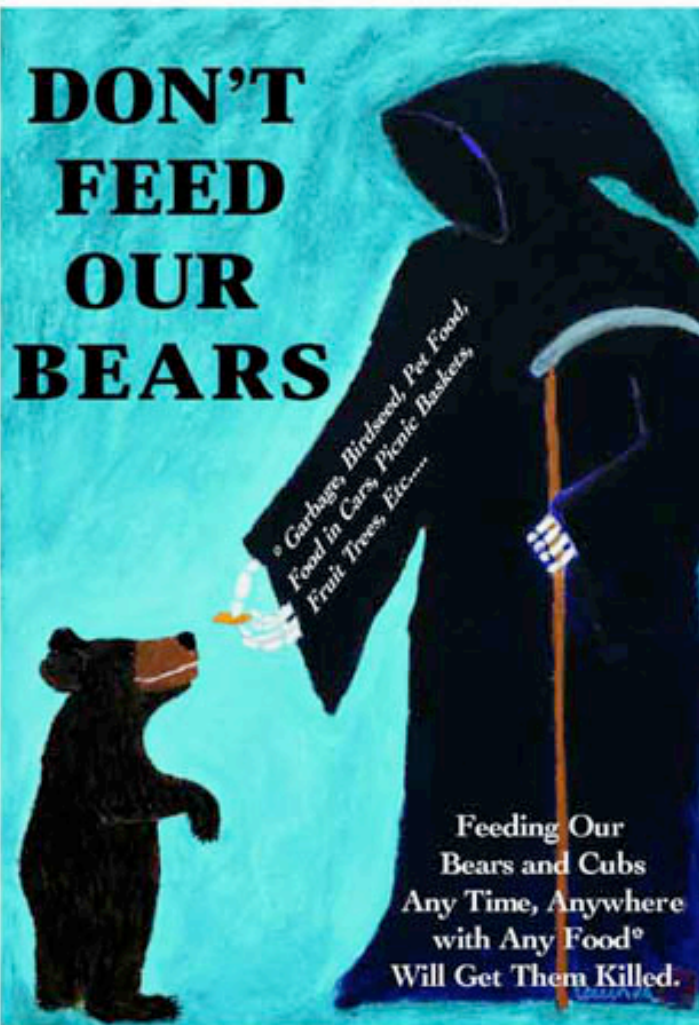
The National Research
Council on Education
National Academy Press
Division of Education of the
National Academy of Sciences
EDUCATION IS A NATIONAL POLICY



Joey, Katie, and Todd Will Be Performing Your Bypass.

“**Before you know it**, these kids will be doctors, nurses and medical technicians, possibly yours. They'll need an excellent grasp of laser technology, advanced computing and molecular genetics. Unfortunately, very few American children are being prepared to master such sophisticated subjects. If we want children who can handle **tomorrow's good jobs**, more kids need to take more challenging academic courses. To find out how you can help the effort to raise standards in America's schools, please call 1-800-96-PROMISE. If we make changes now, we can prevent a lot of pain later on.”

**“A fed bear is
a dead bear”**



**Garbage, Birdseed, Pet Food,
Food in Cars, Picnic Baskets,
Fruit Trees, Etc . . .**

**Feeding Our Bears and Cubs Any
Time, Anywhere, with Any Food
Will Get Them Killed.**



BEAR LEAGUE
WWW.SAVEBEARS.ORG
530-525-PAWS



INPUT 1

NP

agent

a

V

causal action

e

means

manner

motion

NP

object

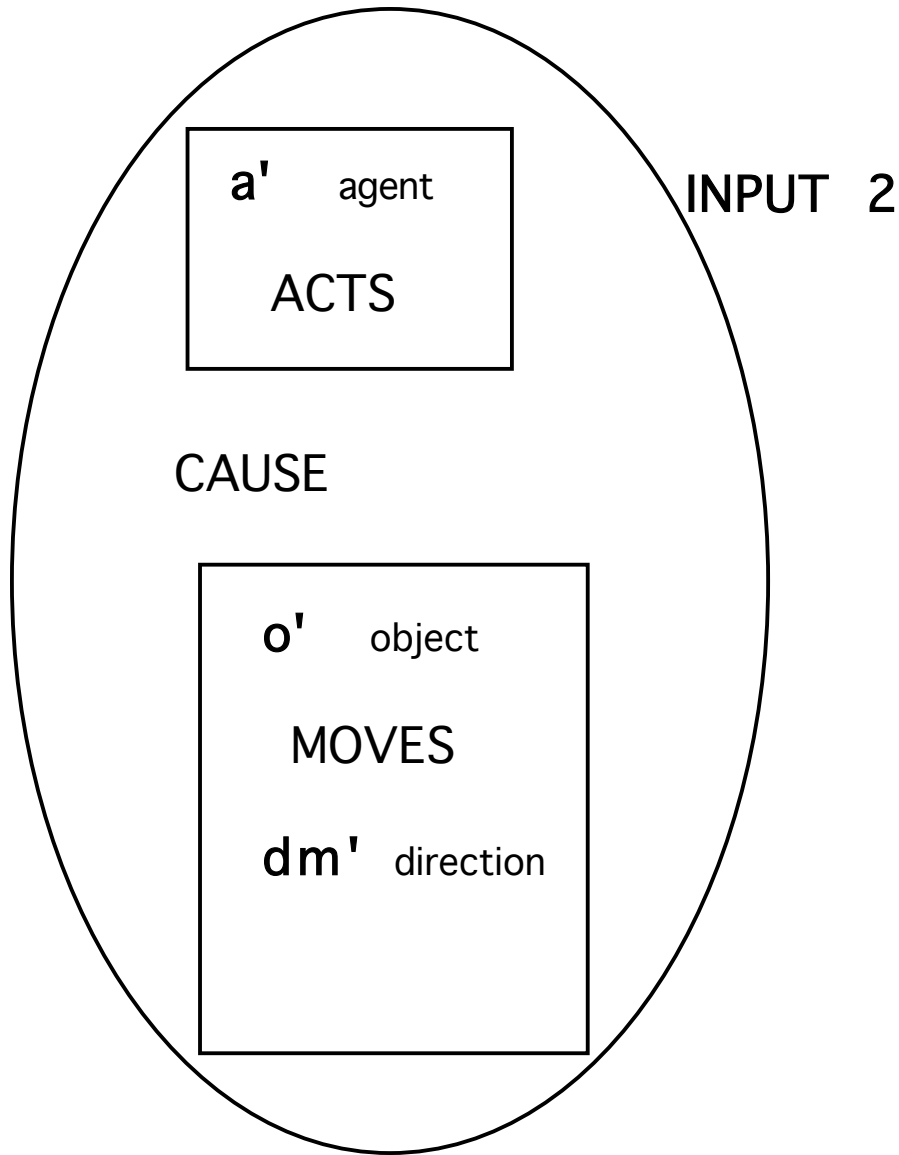
o

PP

direction

dm

Caused-Motion:



INPUT 1

NP

agent

a

V

causal action

e

means

manner

motion

NP

object

o

PP

direction

dm

INPUT 2

a' agent

ACTS

CAUSE

o' object

MOVES

dm' direction

NP

a''

V

e''

NP

o''

PP

dm''

BLEND

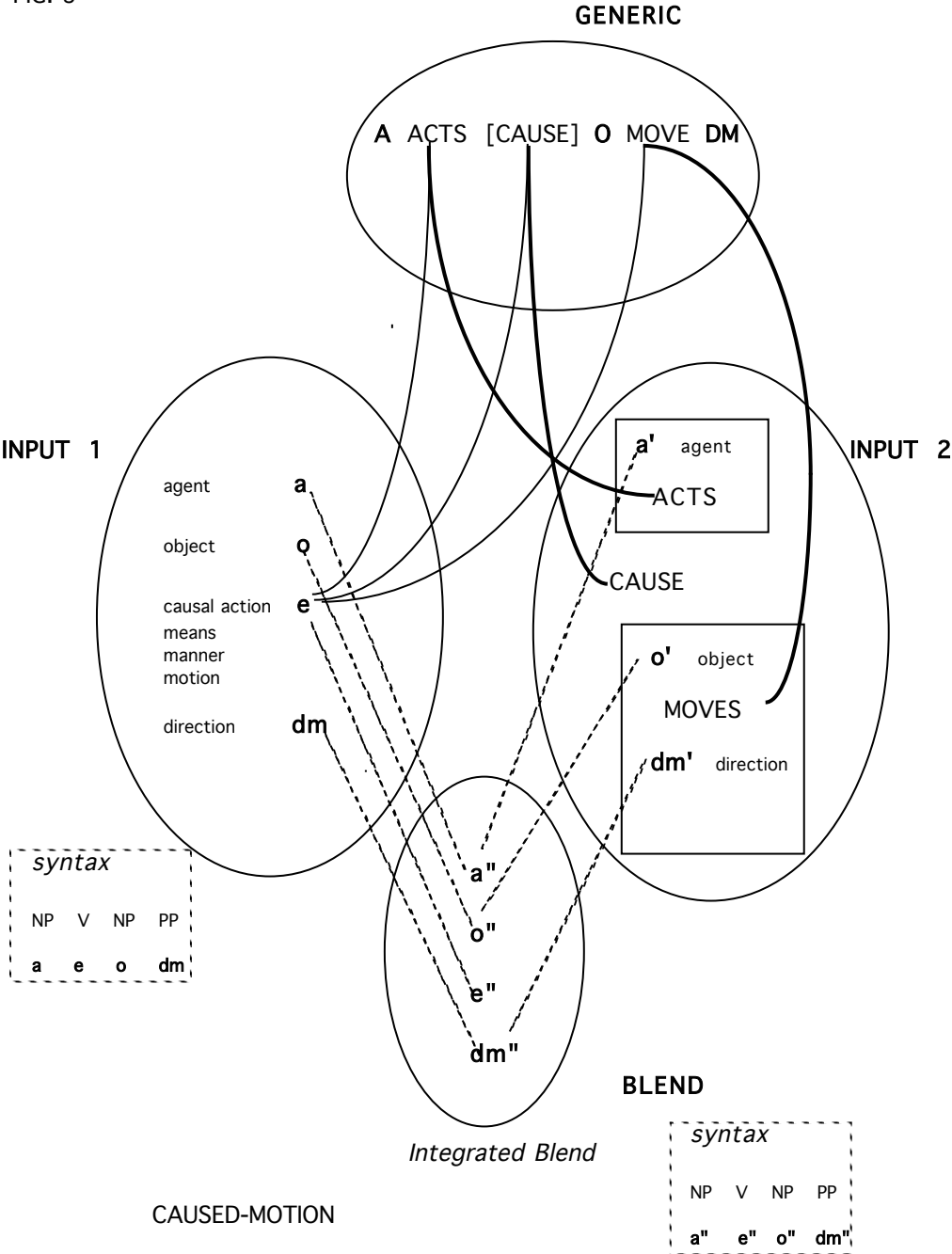
Integrated Blend

Caused-Motion:

Paul sneezed the napkin
off the table.

Junior sped the car around

FIG. 5



"I walked him into the room."

"He sneezed the napkin off the table."

"I pointed him toward the door."

"They teased him out of his senses."

"I will talk you through the procedure."

"I read him to sleep."

"They prayed the two boys home."

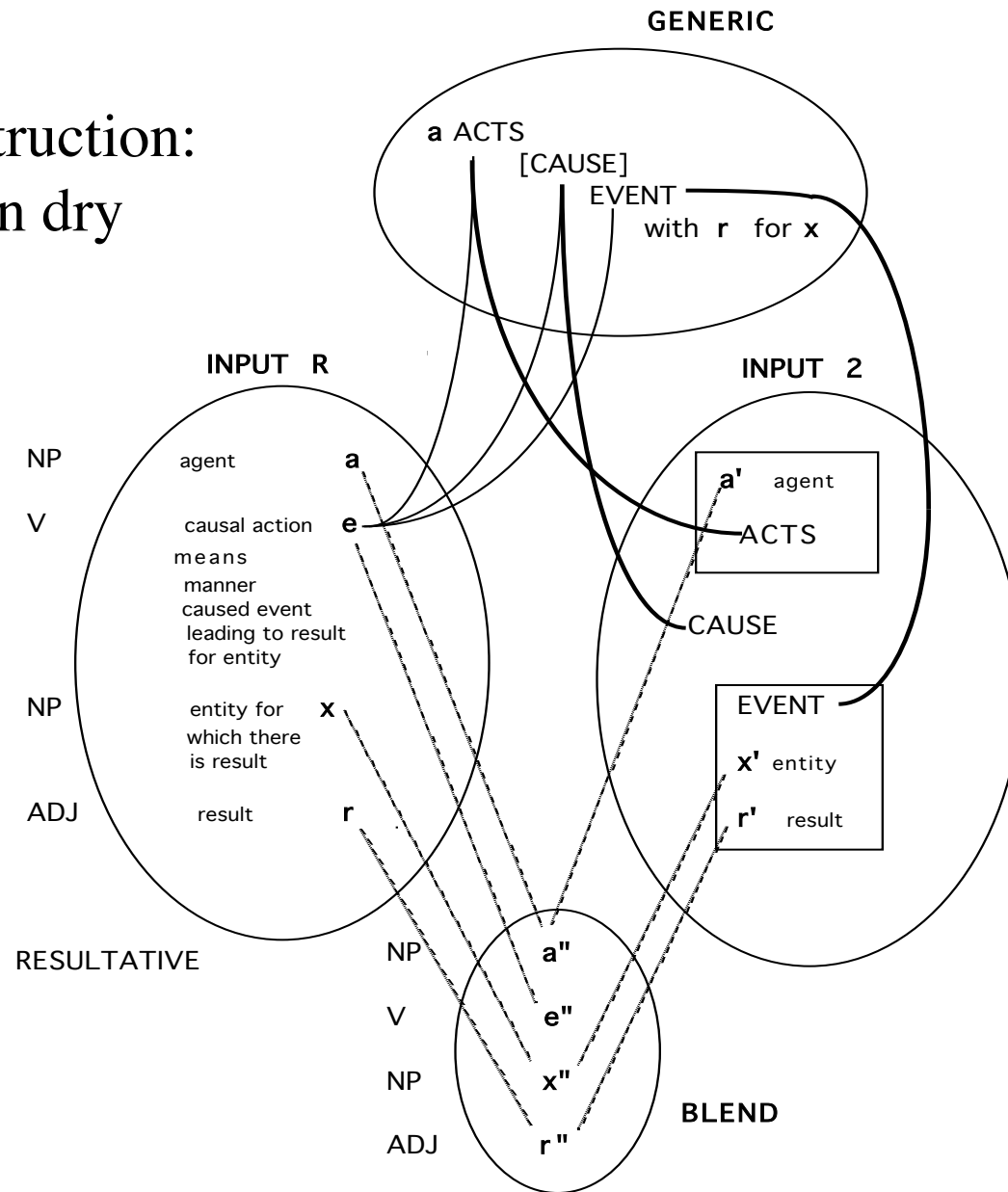
"I muscled the box into place."

"Hunk choked the life out of him."

"He floated the boat to me."

But also: "We blocked him from the door."

Resultative Construction: I boiled the pan dry



Grammatical Constructions

I boiled the pan dry. In the diffuse input, the causal chain runs from forgetting to the invariant position of the burner knob, to the flow of gas, to the flame, to the temperature of the pan, to the temperature of the water, to the level of the water, to the dryness of the pan. The agent performs no direct or indirect action on the pan at all. But in the blend, the compressed structure associated with the grammatical construction is projected together with some selected participants from the diffuse chain of events in the diffuse input. And so, in the blend, the agent is now acting directly on the pan. Moreover, although the boiling of the water is an event and its cause was something the agent did or did not do, there is cause-effect compression in the blend so that *boiling* is an action the agent performed. He even performed it on the pan.

Resultative:

Catherine painted the wall white.

She kissed him unconscious.

Last night's meal made me sick.

He hammered it flat.

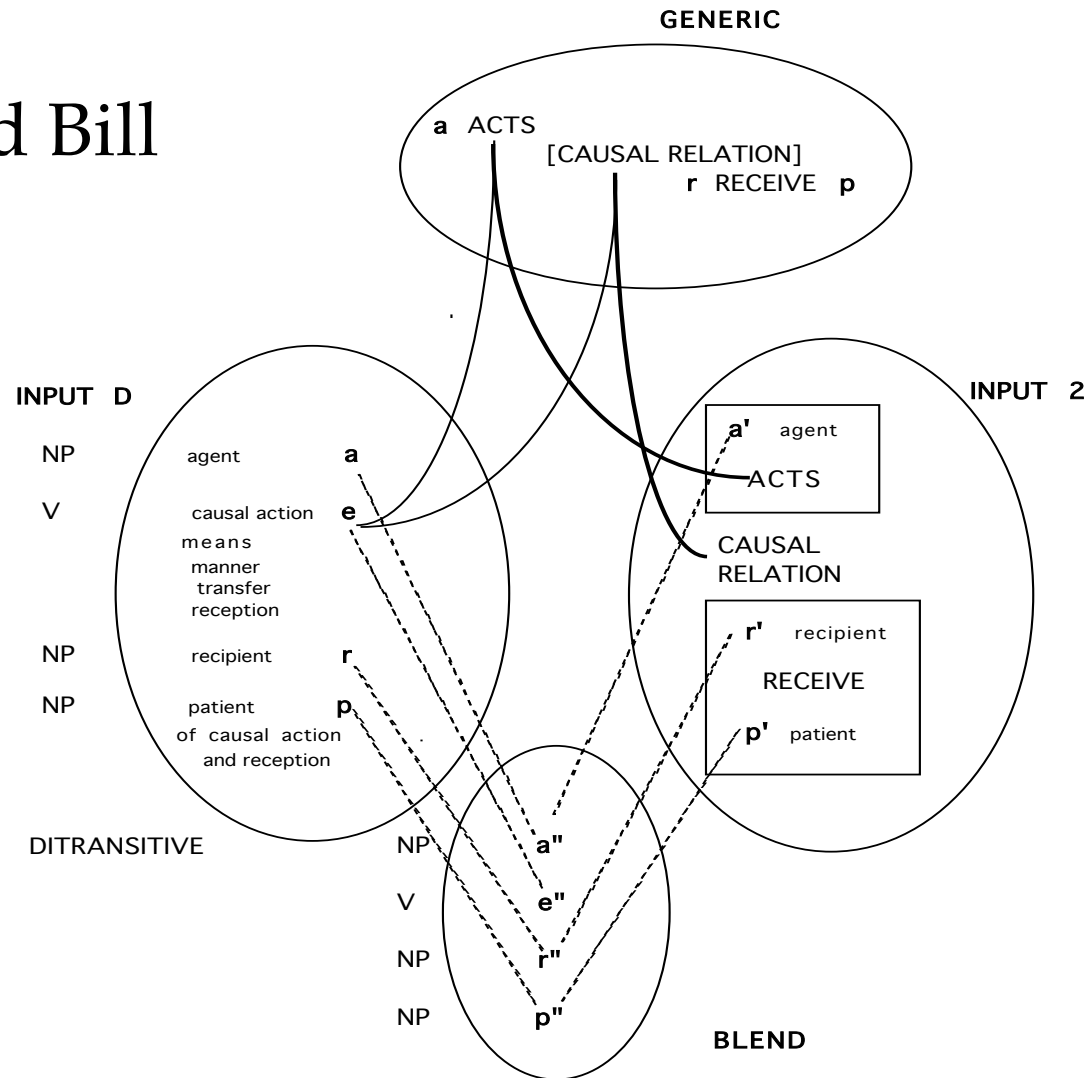
I boiled the pan dry.

The earthquake shook the building apart.

Roman imperialism made Latin universal.

Ditransitive:

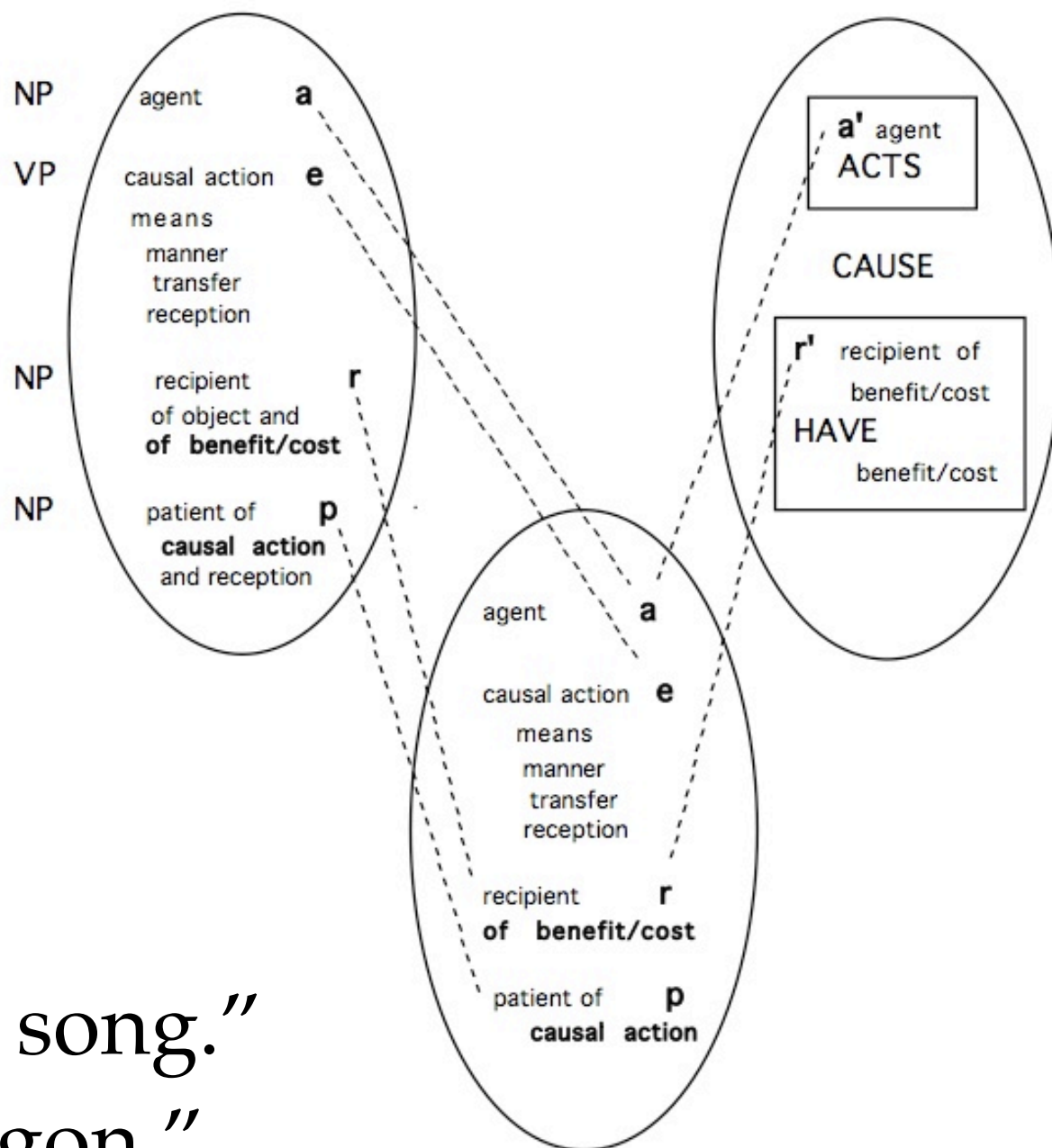
“Mary poured Bill
some wine”



She granted him his wish.
She gave him that premise.
She allowed him that privilege.
She won him a prize.
She bequeathed him a farm.

She gave him a headache.
She showed me the view.
She told me a story.
She denied him the job.
She refused him that courtesy.

“He handed me a dollar.”
 “Pour me some milk.”



Elaborate Ditransitive:

“He sang me a song.”
 “Slay me a dragon.”

Packing to Human Scale Through Blending

Packing to Human Scale Through Blending

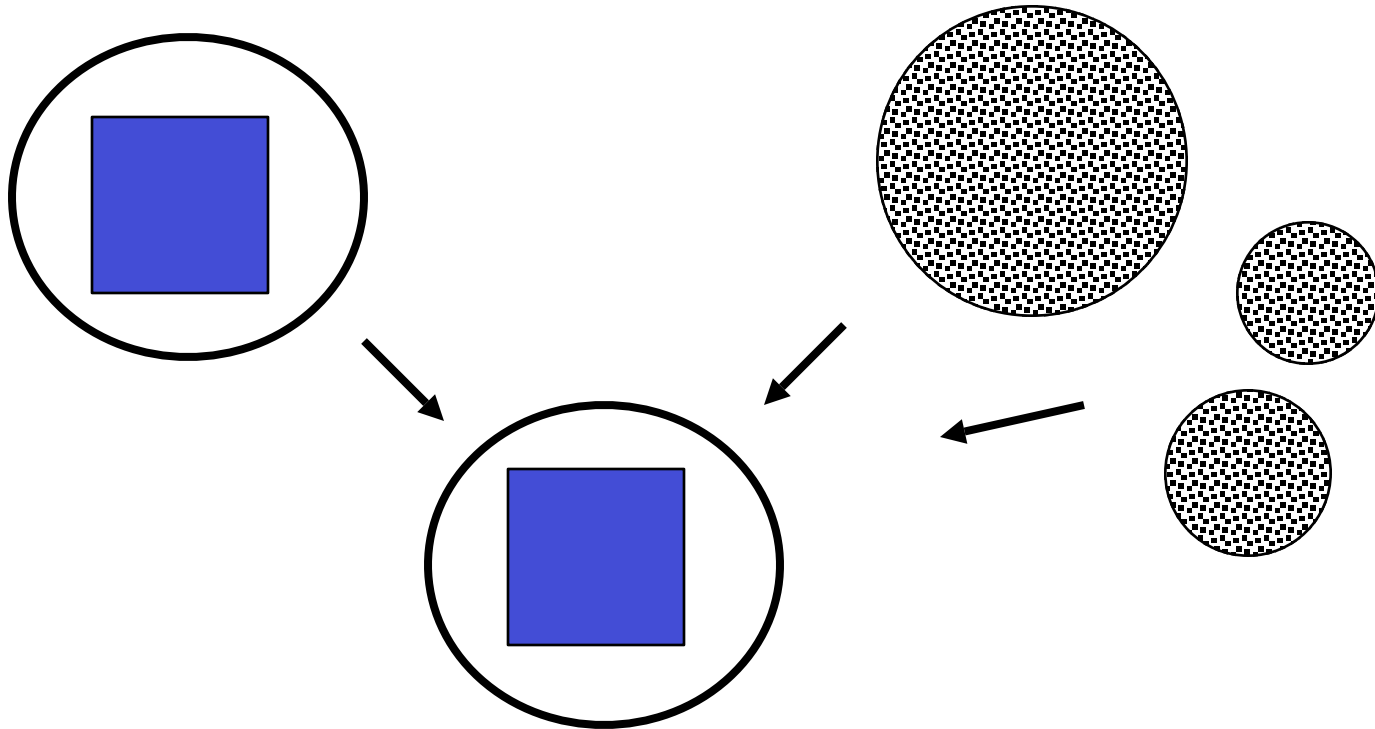


Chappatte, Patrick. 2008. "World Food Crisis," editorial cartoon, *The International Herald Tribune*, 11 April 2008.

Narrative

- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

Borrowing a Compression By Blending



Borrowing a Compression Borrows Constructions

“You are digging your own grave.”

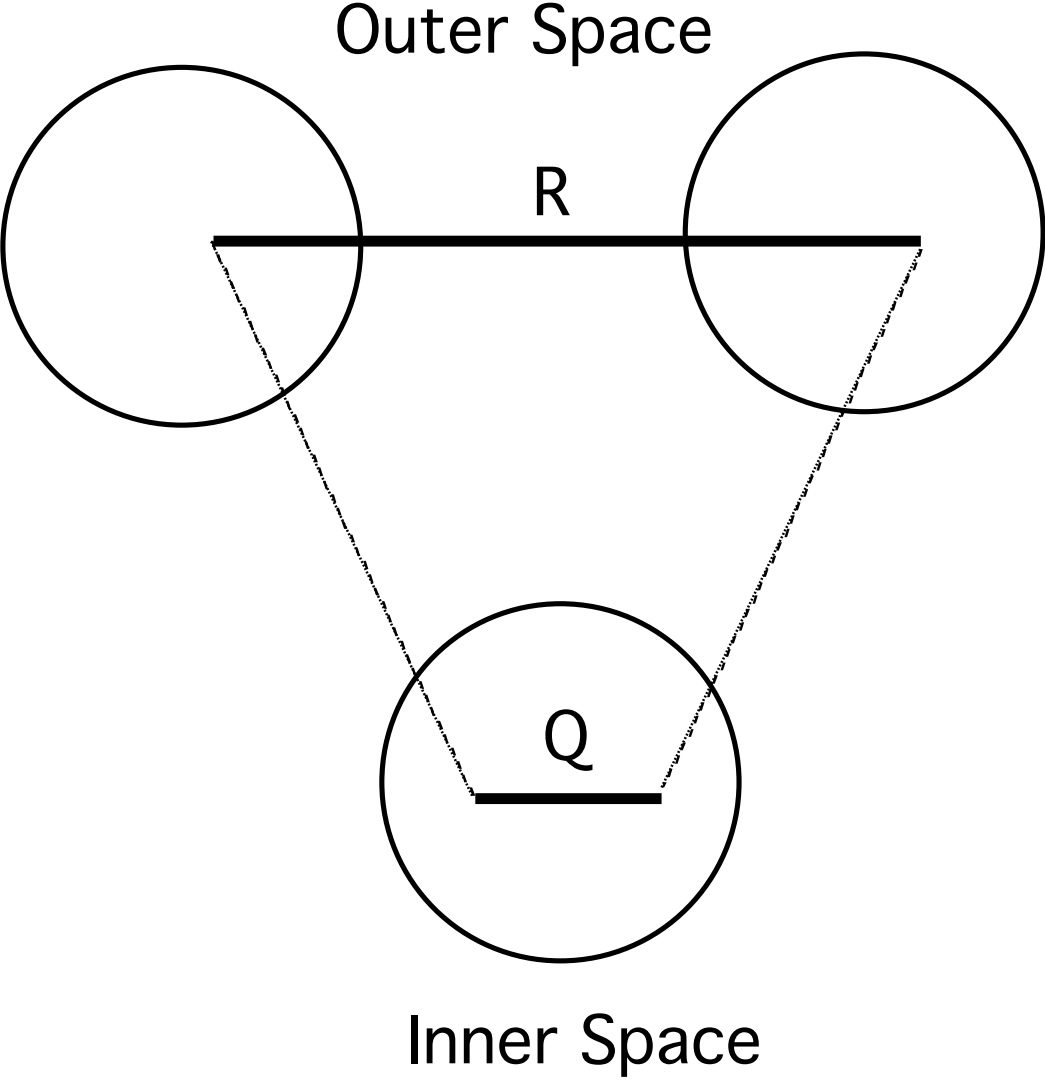
**“If Clinton were the Titanic, the iceberg
would sink.”**

**This happens routinely: basic metaphors,
force-dynamics, mind is a body moving in
space, fictive motion, image-schemas,
images, . . .**

Compressing
outer-space vital relations
into
inner-space structure
in the blend

Outer-space ➔ **Inner-space**

Blending compresses "outer-space" mappings into inner-space human-scale elements that can then be expressed through existing basic human-scale grammatical constructions.



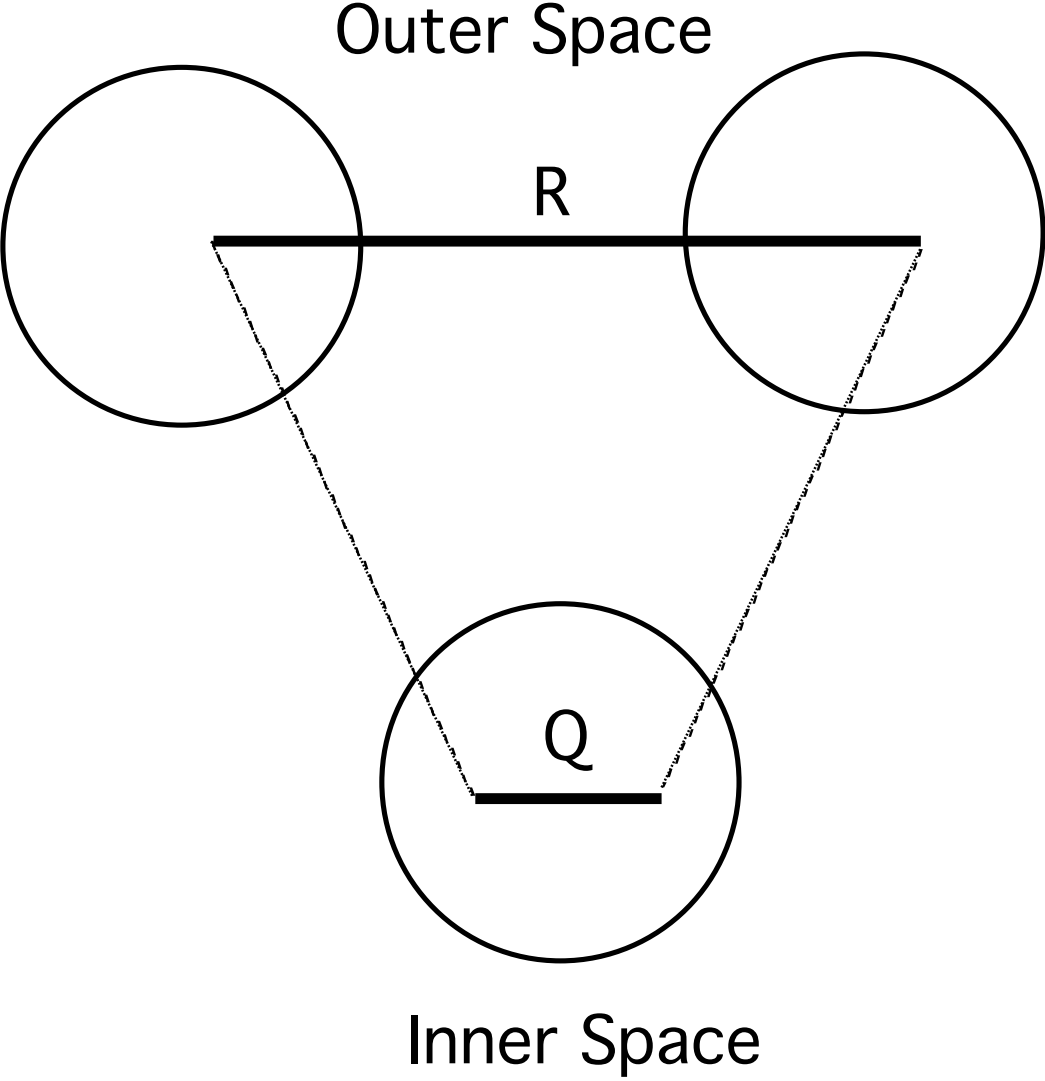
Narrative

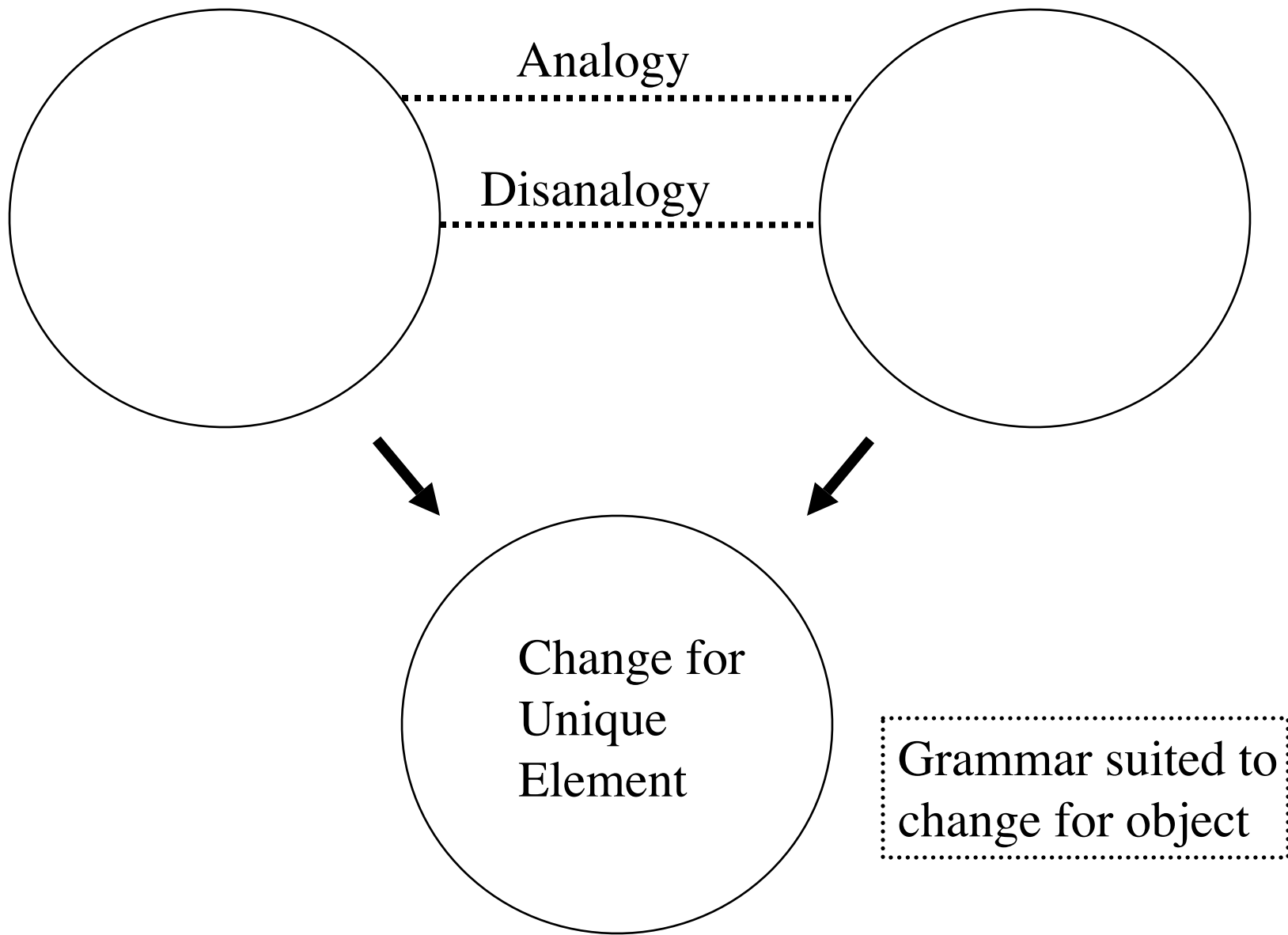
- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

- ◆ Personal Identity

Identity & Change from Analogy & Disanalogy

“Make this envelope disappear”





**"At what altitude do the deer
turn into elk?"**

**"The new theory is that dinosaurs
turned into birds."**

**"My tax bill gets bigger every
year." (Fauconnier)**

“The President changes every four years,” (Fauconnier 1994 [1985])

“The cars get three feet bigger when you enter Pacific Heights,” (Sweetser 1997)

“The fences get taller as you move westward across the United States,” (Sweetser 1997)

“The paint gets darker as you move down the wall.” (Sweetser 1997)



- ◆ Personal Identity

- ◆ Personal Identity
 - ◆ Creating a Human-Scale Compression extending over ranges of activity, time, and space that are not at human-scale.

- ◆ Personal Identity
 - ◆ Creating a Human-Scale Compression extending over ranges of activity, time, and space that are not at human-scale.
 - ◆ Certification, credentials, contracts, character, essence, promises, . . .

Narrative

- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

Narrative

- ◆ Thinking with Feeling (not like H.G. Wells' Time Machine)
 - ◆ Past
 - ◆ Future

- ◆ Other Minds

- ◆ Other Minds
 - ◆ Character, Intentions, Plans, viewpoint, focus, perspective, decision, interdependent decision, risk, planning, imputing motive, giving advice, . . .

Narrative

- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

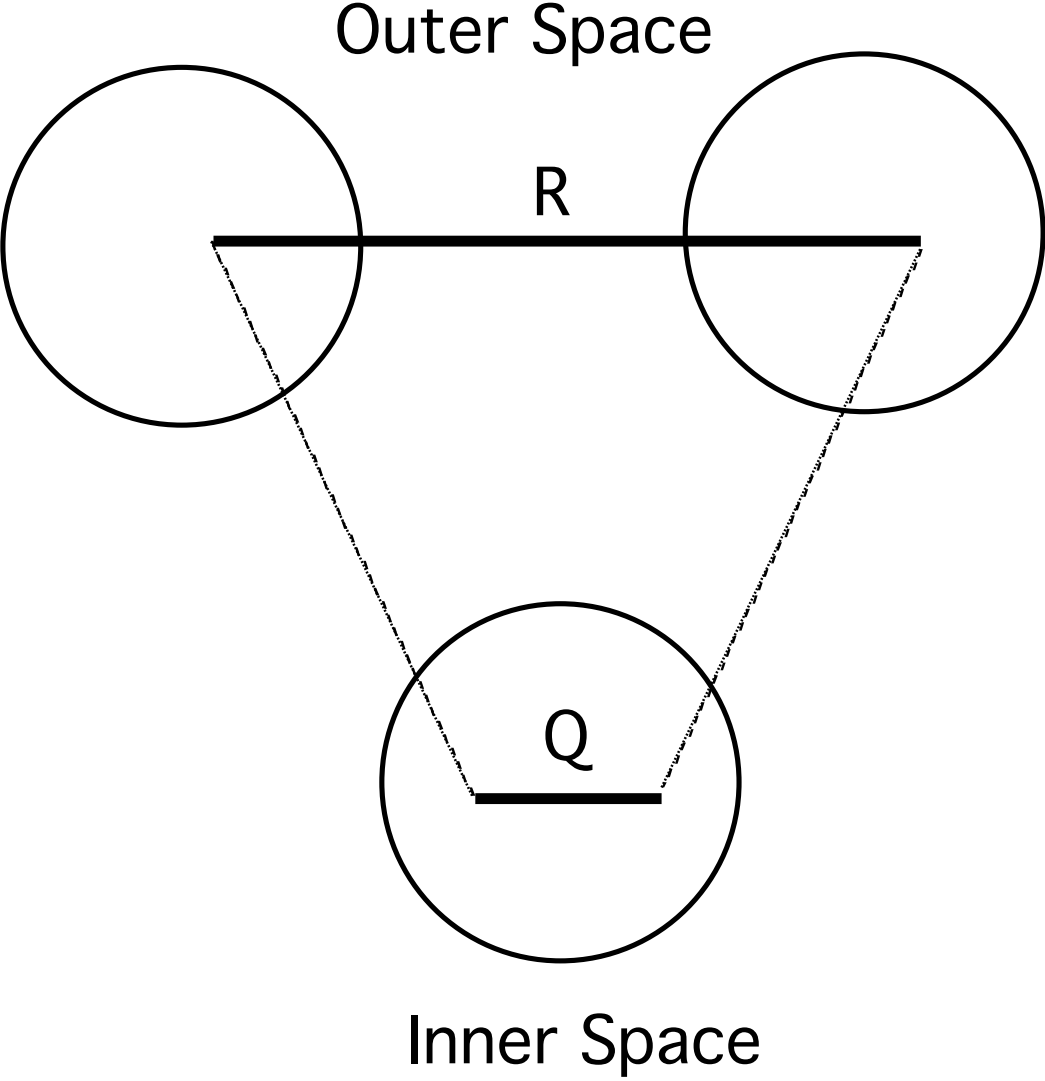
- ◆ Self and Consciousness: Homo economicus
 - ◆ Choice, Decision
 - ◆ Imputing decision processes, motives, etc. to self

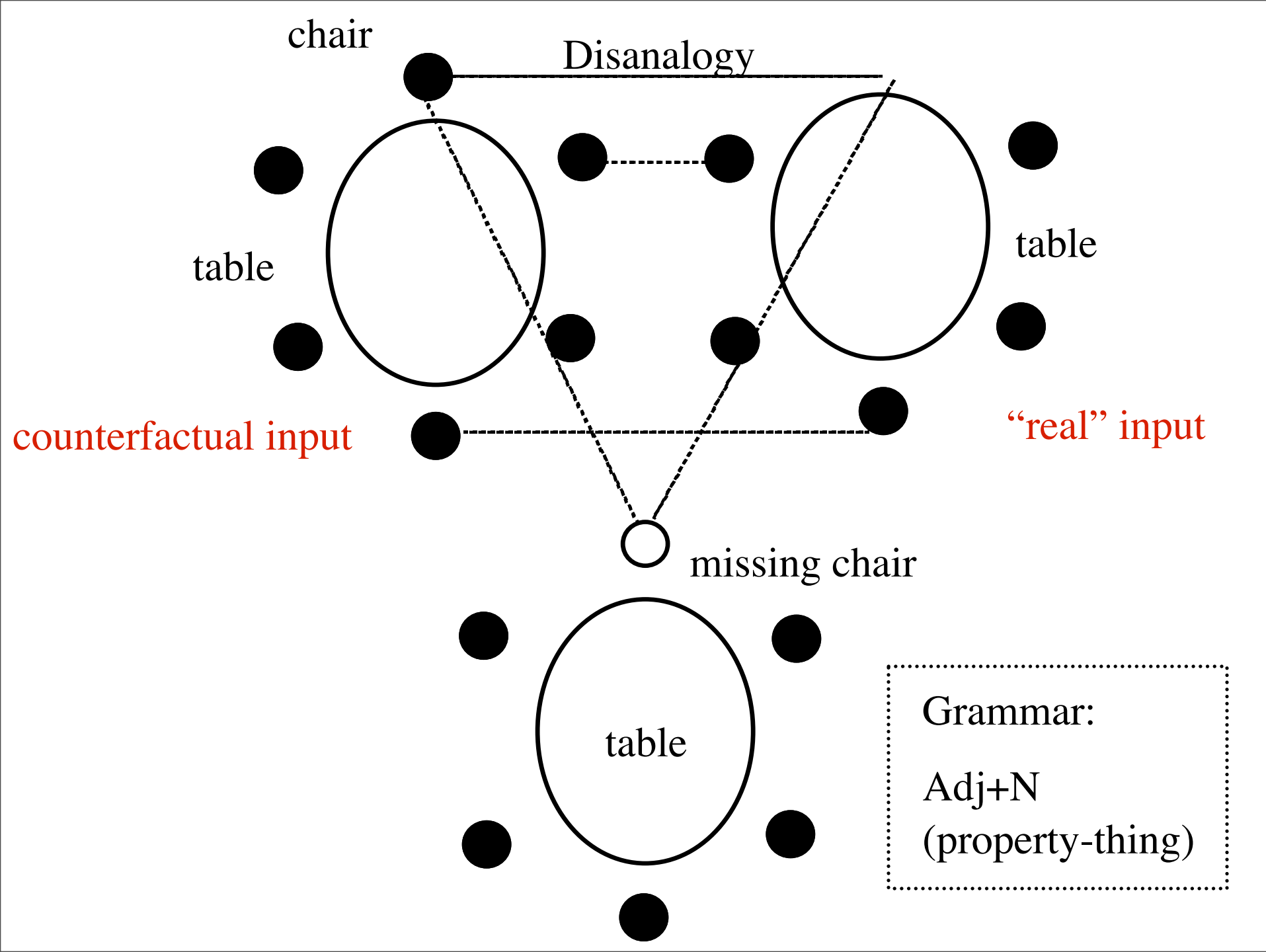
- ◆ Other as Homo economicus

Narrative

- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

- ◆ Counterfactuality. Alternative narratives.





caffeine headache

money problem

nicotine fit

security problem

arousal problem

insulin coma

insulin death

food emergency

honesty crisis

rice famine

Safe beach.

Fake gun. (Coulson & Fauconnier)

Place the flowers in front of the
missing chair.

There is a gap in the fence.

- ◆ Counterfactuality
 - ◆ Alternative narratives
 - ◆ Blame for omission

Narrative

- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

- ◆ Punishment, Redemption (Unpunished, Expiating Guilt)

Narrative

- ◆ Personal Identity
- ◆ Thinking with
 - ◆ Feeling
 - ◆ Past
 - ◆ Future
- ◆ Other minds
- ◆ Self and Consciousness:
 - ◆ Homo economicus
- ◆ Other as Homo economicus
- ◆ Counterfactuality.
 - ◆ Alternative narratives.
- ◆ Language. Social ontologies and deontologies.
- ◆ Physical Ontology
- ◆ Political Ontology and its laws
- ◆ Material Anchors
- ◆ Social Memory
- ◆ Punishment
- ◆ Redemption
- ◆ Guilt
- ◆ Sin
- ◆ Money

Conceptual Blending in Higher-Order Human Cognition

School of Literature, Communication, and Culture
Georgia Institute of Technology



Mark Turner

<http://markturner.org>

Department of Cognitive Science



CASE WESTERN RESERVE
UNIVERSITY EST. 1826